WINTER 1994
VOLUME XVIII
NUMBER 2

LOCOMOTIVE QUARTERLY

The New York, New Haven & Hartford reflected a marked diversity in its motive power. The electrified region between New Haven, Conn. and the New York City area was almost a separate railroad in its nature. The busy New Haven Boston route, called the Shore Line, encountered limited grades, over which medium sized passenger power hauled impressively heavy trains. Its inland main lines over the lower Berkshires, on the other hand, put power to more severe tests.

This diversity caused the road to employ widely varied locomotives. Pacifics and Hudsons performed well on Shore Line passenger operations, but the huge freight volume on the Poughkeepsie Bridge route, where saw-tooth grades were most demanding, offered a happy home for a fleet of Santa Fe Types that would have tied the Shore Line in knots if intermingled with the routes frequent fast passenger runs. Instead, a diverse family of Mountain types kept truly fast freight runs from interfering with tightly scheduled passenger runs in what is now known as the Northeast Corridor. Mountains also predominated on other heavy inland routes serving Hartford, Conn. and Springfield, Mass. among other vital New England locations.

Those Mountains include a group of three-cylindered power that proved truly a mixture of vices and virtues. Fast, smooth-running engines when fresh from maintenance, they too readily went out of adjustment when operated regularly at high speeds. On balance, the New Haven reluctantly decided that their good work when carefully tended merited keeping them as built rather than converting them to conventional two-cylinder form.

Red Ball Freight, New Haven Style. Roaring south towards Hartford at Warehouse Point, three-cylindered Mountain 3562's exhaust reflects the speed for which this class was famed. Water color by Mike Pearsall.

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LOCOMOTIVE QUARTERLY is published four times annually by Metaphor, P.O.Box 383, Mount Vernon, NY 10552. Subscriptions: U.S.A. and possessions: $44.00 per year; Canada $47.00US per year. Overseas subscriptions: $48.00US per year. Single copy price $12.00US; Canada $12.85; Overseas $13.00US. Postage paid at Mount Vernon, NY and additional mailing offices. Title registered as trade mark.

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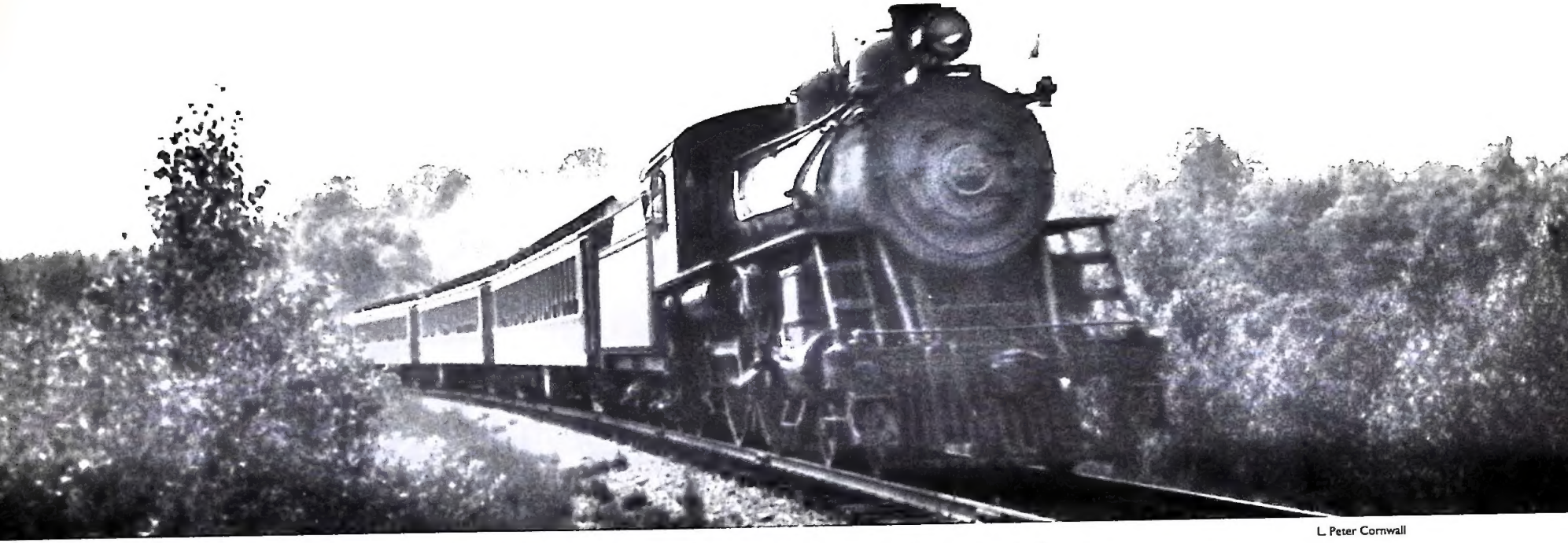
Printed in U.S.A. ISSN 0276-6736

Robert F. Collins

Engine 3200, first of the NYNH&H 2-10-2 types, works eastward up the long grade from Hopewell Junction at Poughquag, N.Y. with the 55 cars of Train OA-4, May 17, 1947.

George E. Votava

Hudson 1406 roars west at Branford, Conn. on the home stretch to New Haven with Washington-bound 2nd 175, The Colonial, on August 31, 1946. Typical of these runs, the 13-car consist includes an RPO car, baggage car, five coaches, a Diner, and four pullmans.



L. Peter Cornwall

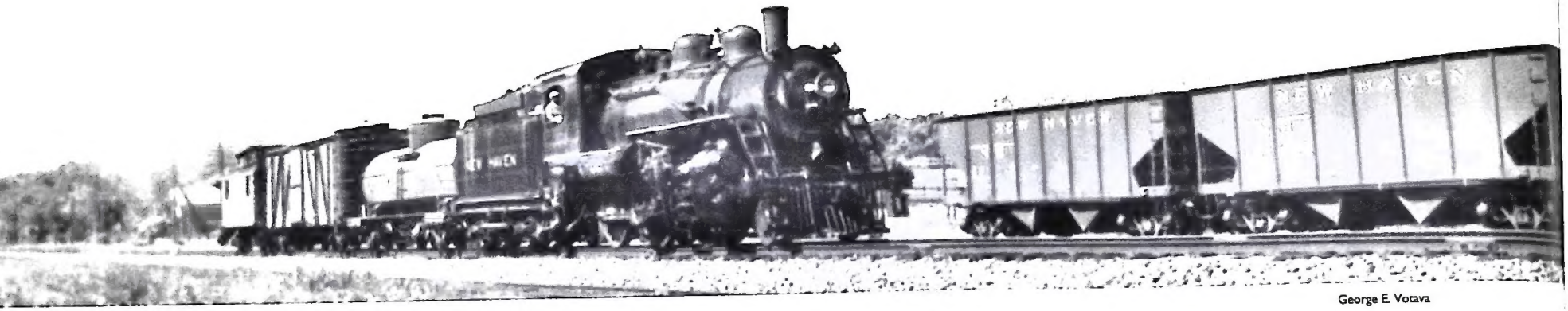
Modernized American type 1275 handles a weekly Saturday summer extra from New York over the old Air Line, the former New York & New England, near East Hampton, Conn. in July, 1936.

NEW HAVEN SYSTEM LOCOMOTIVES

The New York, New Haven & Hartford roster presented broad contrasts. Its huge Readville Shops, well able to handle complex operations, kept even the oldest power reasonably up to date and in good repair. At the same time, the company welcomed new ideas and unhesitatingly tried many motive power innovations. Unusual was the high proportion of passenger power needed for the heavy traffic in what is now called the Northeast Corridor the Boston-New York-Washington route of the New Haven and the Pennsylvania Railroad.

Significant, too, was the NYNH&H region's terrain. The famed Shore Line had few notable grades, but its many curves and bridge restrictions were severe challenges. Grades were an important factor, however, on the hilly ex-Central New England route over the Poughkeepsie Bridge. No passenger trains served here in later years, but this line to Maybrook, N. Y. tied the New Haven System to vital Western connections.

Main line freight power ranged from Moguls in local services to huge 2-10-2s and three-cylindered Mountain types for through freight and tonnage traffic. Ten streamlined Hudsons supplemented 50 heavy Pacifics on the fast, heavy passenger runs for which the road was famed. Backing them on other runs were lighter Pacifics, Atlantics, Ten Wheelers, and Americans.



George E. Votava

Mogul 368, superheated and equipped with Southern valve gear, works the eastbound local freight out of Danbury at Hawleyville, Conn., September 10, 1938.

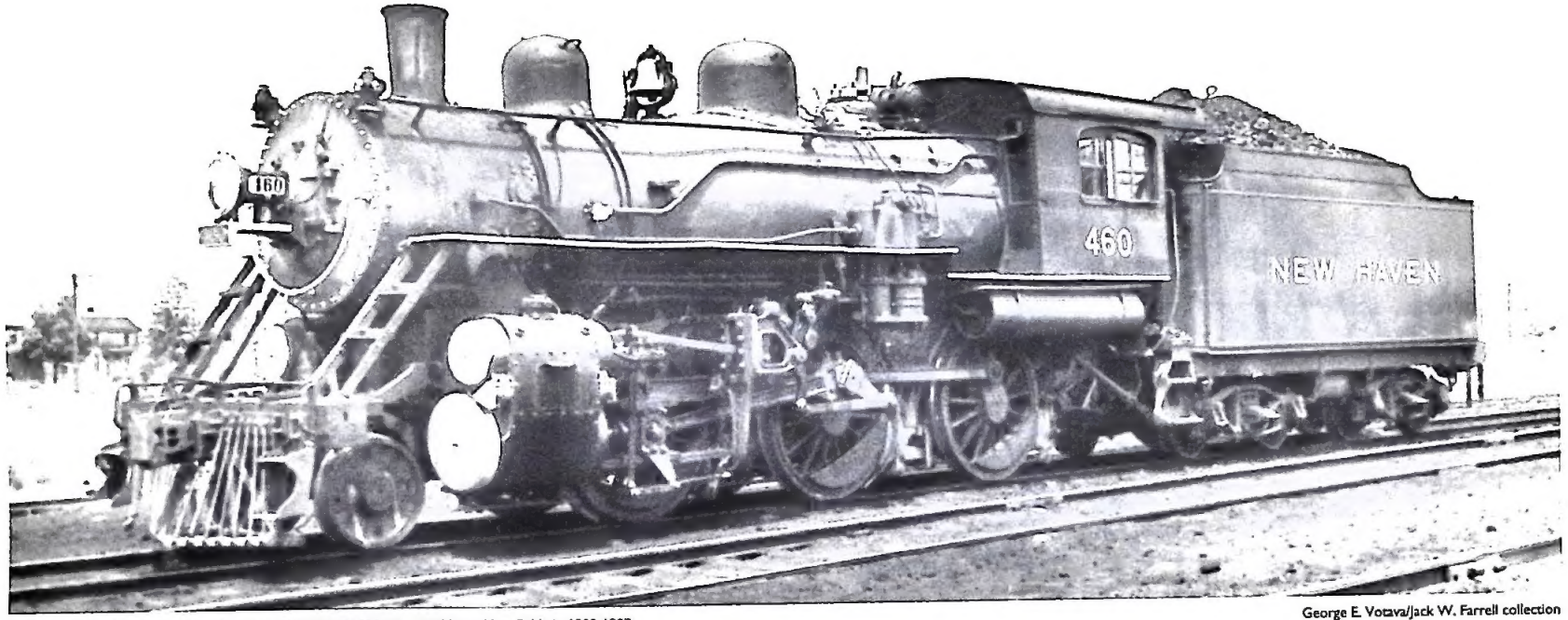
Unlike many other roads in the early 1900s, the New Haven continued to favor Moguls for main line freight traffic. Such engines built between 1903 and 1907 could handle main line freight adequately because Shore Line grades were modest and the engines were large examples of their type. Not until the first Mikados arrived in 1916 were the Moguls displaced in significant measure. Thereafter, a shift to bigger power began in earnest.

The subsidiary Central New England took another tack in 1912. To fight the heavy grades on its Poughkeepsie Bridge route, it acquired Consolidations 150-164. They earned an enviable reputation as tonnage handlers and earned the nickname Bull Moose. New Haven management, however, saw them as power for a specific purpose and added no more of their type.

In 1916, two groups of Mikados arrived from Alco's Schenectady Works. J-1 class engines 3000-3024 were moderate sized engines intended for general service. J-2 Engines 3100-3107 were another matter. Far heavier, they were first tried on the Poughkeepsie Bridge route. Built without stokers, they were demanding of crews and were soon supplanted by later, larger power. The J-1 engines continued in freight service over several New Haven routes, but the J-2 class were restricted increasingly to such chores as heavy transfer and switching service. Given stokers, they might have seen wider application, but other newer power left little place for them as through freight haulers.

Early in World War I, before the United States Railroad Administration took over locomotive procurement, the New Haven System made a major break with its past. In that year, L-1 class Santa Fes 3200-3249 arrived. Like the Moguls, they rode on 63-inch drivers, but shared almost nothing else with their predecessors. Rated at 77,800 pounds tractive force, they offered more than double a Mogul's output. They could handle impressive tonnage, but at limited speed. These huge engines became a problem on the Shore Line for that reason. They did prove supremely suitable on the tough trackage between Poughkeepsie and New Haven, and most of them spent their productive lives in that territory.

Soon after, the USRA assigned ten standard light 4-8-2s to the

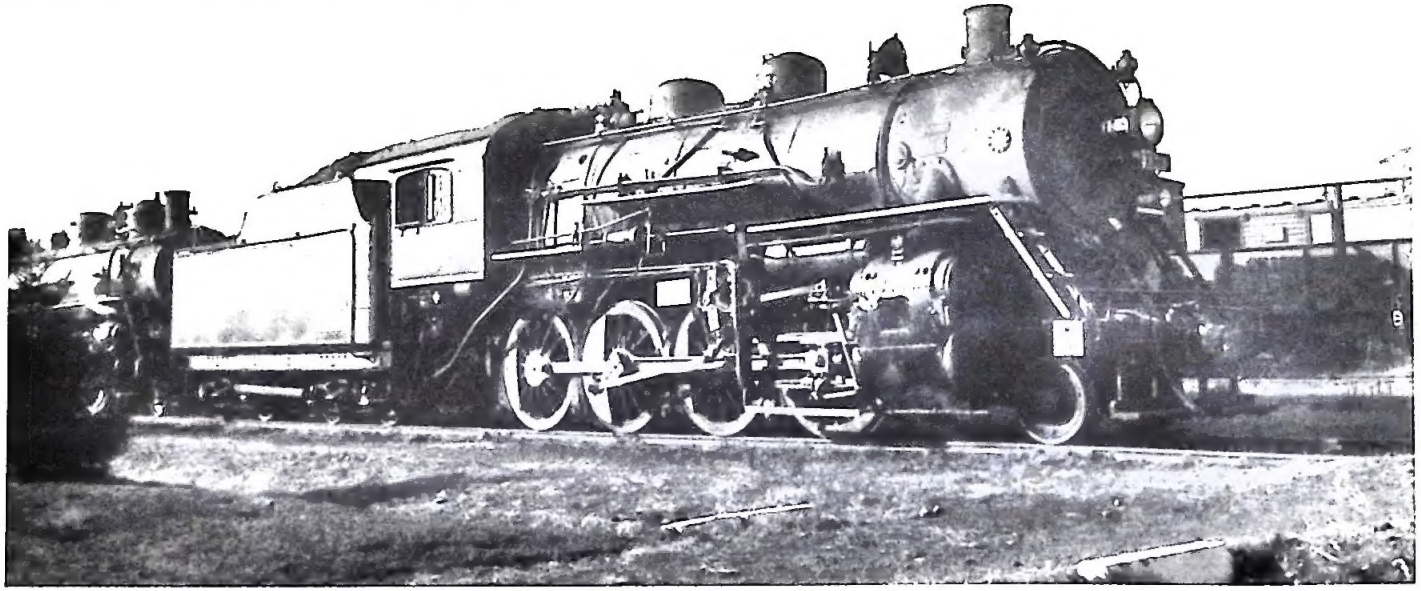


K-1-b 260-299, 325-479 20x28cyl 63"DR 200BP 30223TF 151000-154000wgt Alco, Baldwin 1900-1907

George E. Votava/Jack W. Farrell collection

Engine 460 (above), a Baker valve-geared, superheated Mogul, rests at Hopewell Junction, N.Y. while assigned to the Fishkill local freight on May 29, 1938. Similar Mogul 414 (below) is at Willimantic, Conn., March 29, 1936.

L. Peter Cornwall

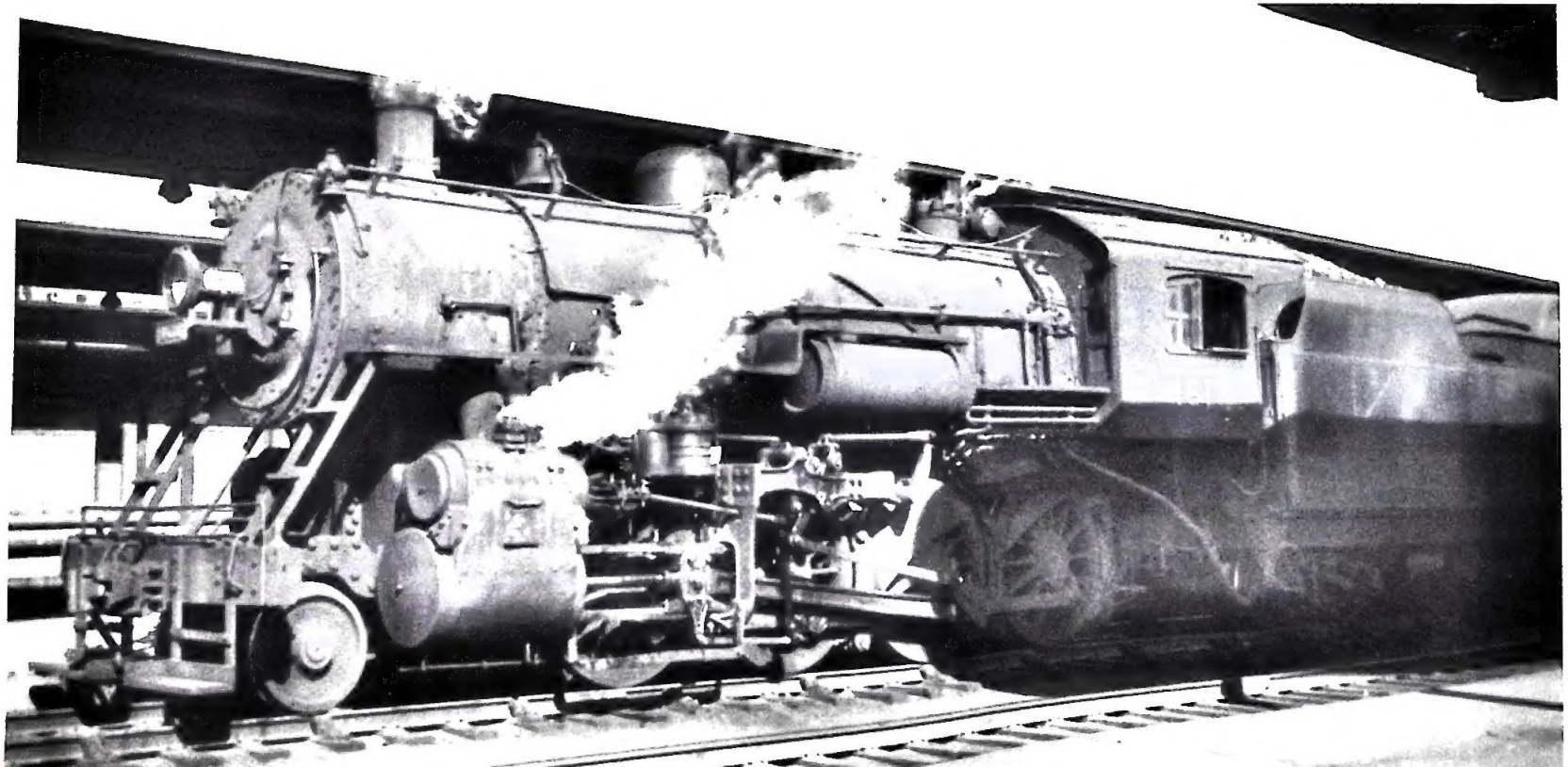


F-5 150-16424x32cyl 63"DR 180BP 44800TF 213000wgt Alco 1912

George E. Votava

Consolidation 158 (above, Readville, Mass., October 17, 1937) is one of 15 ex-Central New England engines known as the Bull Mooses. Sister 161 (below, South Station, Boston, February 27, 1937) is one of the group's final five that carried Baker rather than Walschaert valve gear.

L. Peter Cornwall



L. Peter Cornwall

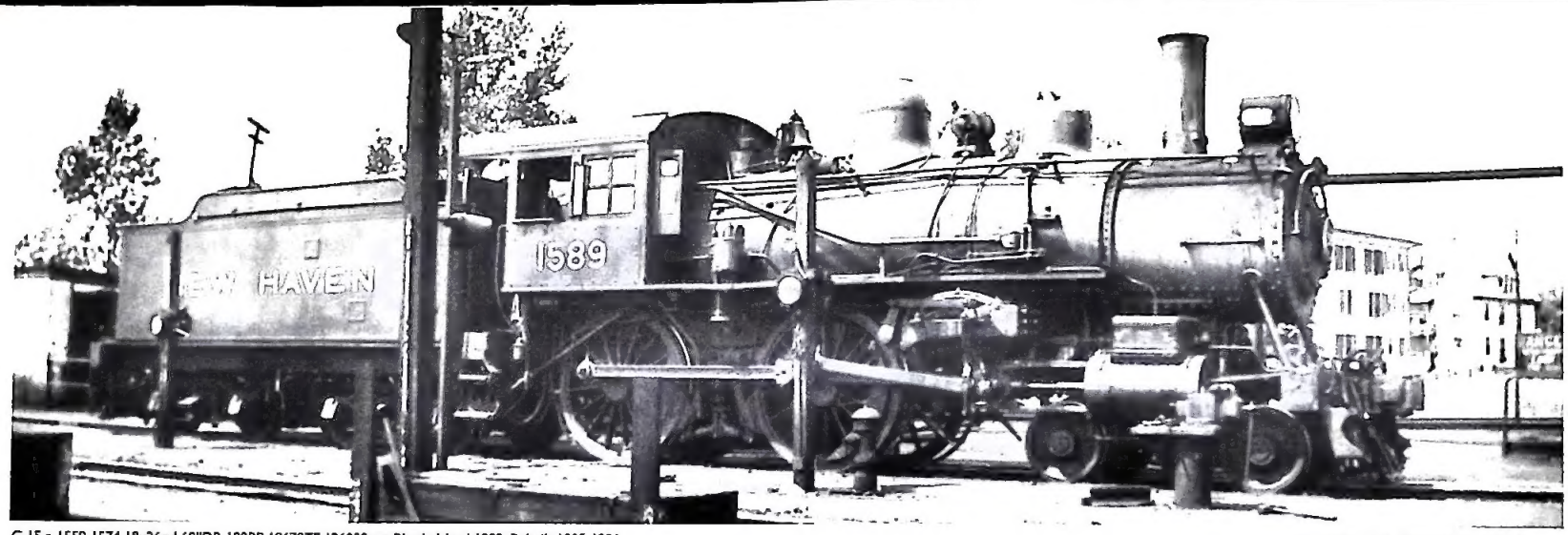
May 8, 1936 finds the streamlined light-weight Comet off the road again for repairs. In its stead, Atlantic 1100 and two coaches will soon make short work of this scheduled run to Providence, R.I., easily making the speeds these Atlantics first demonstrated three decades earlier.

New Haven, which became class R1, Numbers 3300-3309. These Alco-Richmond engines offered 53,000 pounds tractive force. With 69-inch drivers, they could handle sizable Shore Line freights at a speed that kept them clear of the many high-speed passenger runs between Boston and New Haven, where electric power took over to reach New York City. They also proved suitable for passenger service when called upon, as on the Housatonic Valley line to Pittsfield, Mass.

So pleased was the New Haven with these engines that they became the basis for a large Mountain type fleet. In 1920, the New Haven added similar Alco-Schenectady Engines 3310-3339, initially as class R-1a. The last five arrived with Elesco feedwater heaters, which were delivered new on all R-1b Engines 3340-3348 in 1924. In time, the prior Mountains received this equipment and the R-1a group were folded into class R-1b. The R-1 engines, which had Cole rather than Delta trailing trucks, retained their original class.

The final 1924 4-8-2 was to be 3449, but the company made it Number 3550 and refined the design as a test for larger 4-8-2 type development. The USRA firebox was retained, but boiler size was increased, bringing a new level of speed and power. Boiler pressure went from 200 to 250 pounds, yielding almost 10,000 pounds added tractive effort. Classed R-2, this engine's success led to delivery of R-2a Engines 3501-3507 in 1926. Similar to the 3500, they were 2,500 pounds heavier, with boiler pressure increased to 265 pounds.

Even as the R-2a engines were in production, the New Haven turned to the three-cylinder concept then being favored by Alco. The builder supplied R-3 Engines 3550-3552 in 1926,



C-15-a 1559-1574 18x26cyl 69"DR 180BP 186?9TF 126000wgt Rhode Island 1893. Rebuilt 1905-1906

Roger Borrup/L. Peter Cornwall collection

American type 1589, one of many assembled by Readville Shops, though saturated, has been given Southern valve gear. East Hartford, Conn., September, 1933.

carrying three 22x30 cylinders rather than the R-2a's pair of 27x30 cylinders. Rated at 71,000 pounds tractive force, they proved outstanding performers in fast freight service. Regrettably, they soon proved expensive to maintain. In the long run, the New Haven chose to stay with their performance benefits despite the maintenance headaches.

All R-2 and R-3 engines came with McLellan water-tube boilers. These turned out to be a serious problem and conventional fireboxes were installed within a few years.

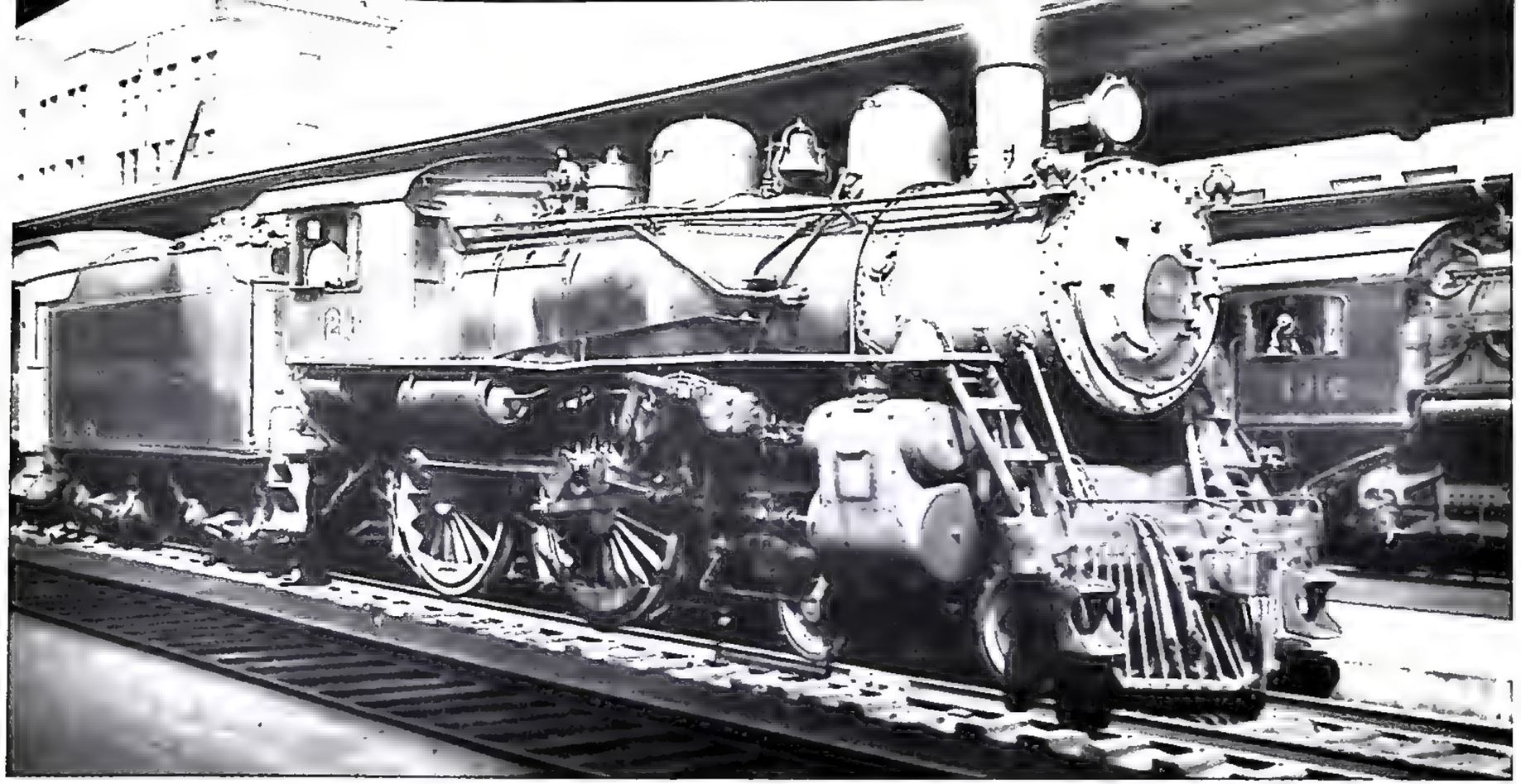
The R-1 engines carried Baker valve motion, but the New Haven turned to Southern gear on the later two-cylindered Mountains, as it had on the 3200 series 2-10-2s and many rebuilt engines. In later years, Readville Shops turned to a heavy-duty Baker gear and installed it on most of these engines. The three-cylindered 4-8-2s, however, retained their Walschaert motion.

Passenger power saw rapid advances before World War I. At the turn of the century, many heavy American types arrived in two versions: 73-inch drivered A-1's for general passenger service; 79-inch drivered A-3's for the high-speed Boston-New York Shore Line trains. Soon found inadequate for a fast-growing business, they took over much local and commuting work. Added to this pool was a third 4-4-0 group, a series literally created from old engines' parts by Readville Shops.

In 1907, Alco supplied 73-inch drivered I-1 Pacifics 1000-1031 for the road's heaviest passenger trains plus a dozen 79-inch drivered Atlantics slated to handle the fast five-hour Boston-New York runs. The Atlantics easily made the time with five six-wheel trucked wooden cars, but these trains were growing longer and steel equipment was on the horizon.

In 1913, the New Haven again added larger engines. Baldwin delivered 73-inch drivered I-2 Pacifics 1300-1349 and 79-inch drivered I-3 Engines 1090-1095, similar to each other save for driver diameter. Once again, growing business and longer trains demanded something more.

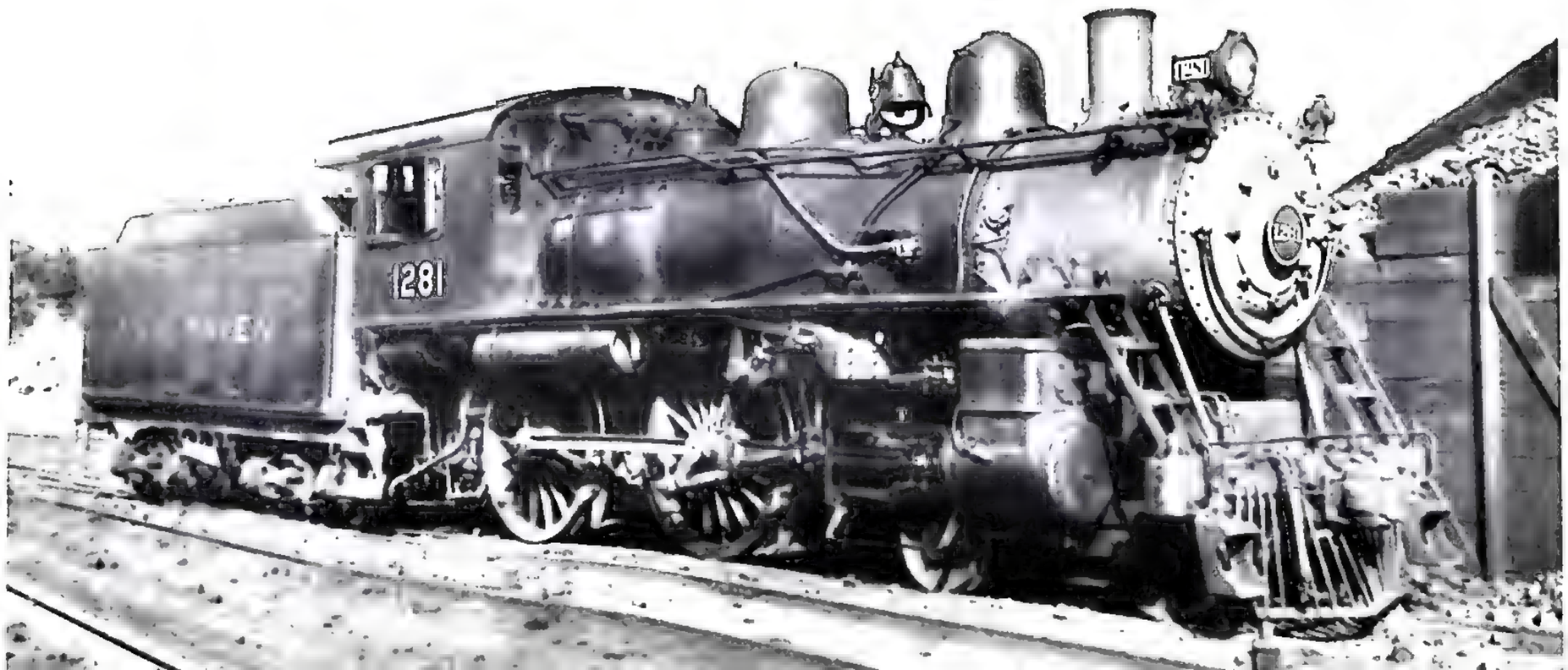
The ultimate New Haven Pacifics, class I-4, came from Alco in 1916. Engines 1350-1399 were as heavy as Shore Line bridges could handle. Bigger boilers brought more capacity and the Shore Line power situation was well in hand. In later



A-3 1200-1214 20x26cyl 78"DR 200BP 23466TF 137000wgt Alco 1900-1902 L. Peter Cornwall

The two newer classes of NYNH&H 4-4-0s: Engine 1210 (above, South Station, Boston, July, 1933) is one of the 79-inch drivered series built for the fastest Boston-New York runs. The 1281 (below, Hyannis, Mass. ca. 1935) belongs to the 73-inch drivered group built initially for general passenger service. By the 1930s both were in the local and commuter pool.

IA-1 1250-1284 20x24cyl 73"DR200BP 23146TF 131000wgt Alco 1903, 1896 L. Peter Cornwall



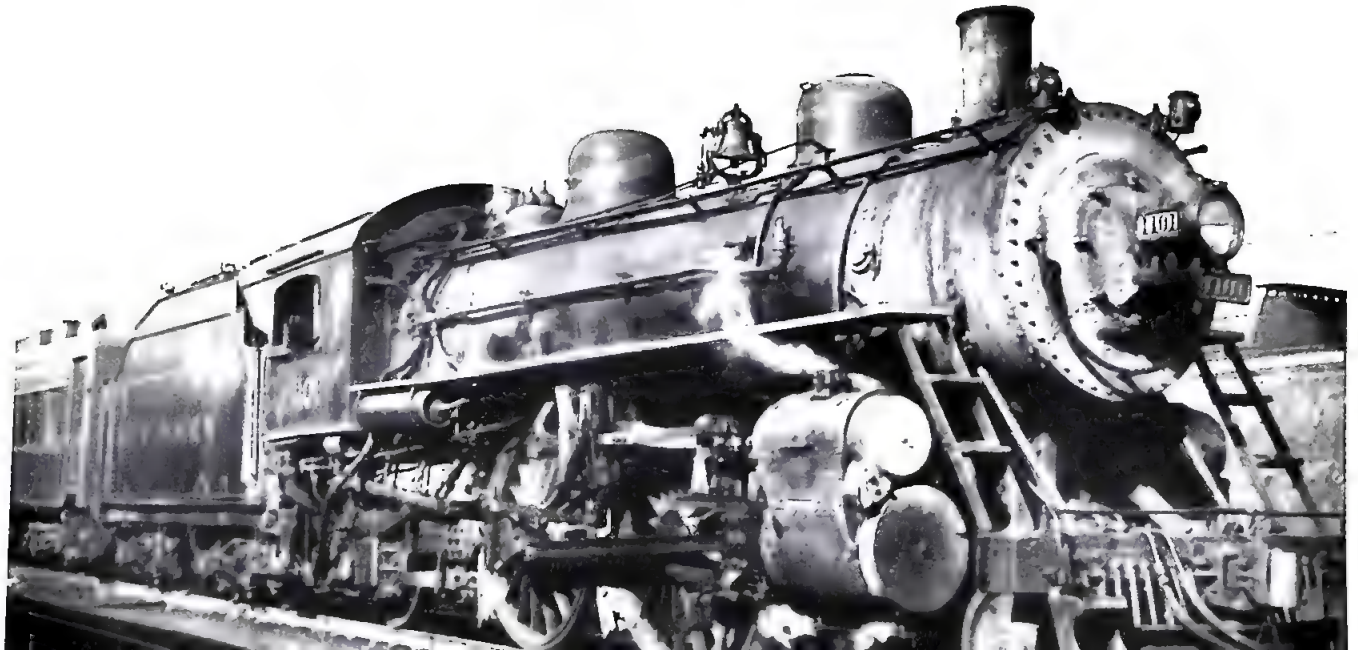
I-1 1000-1031 22x28cyl 73"DR 200BP 31600TF 229500-232000wgt Alco, Baldwin 1907-1910

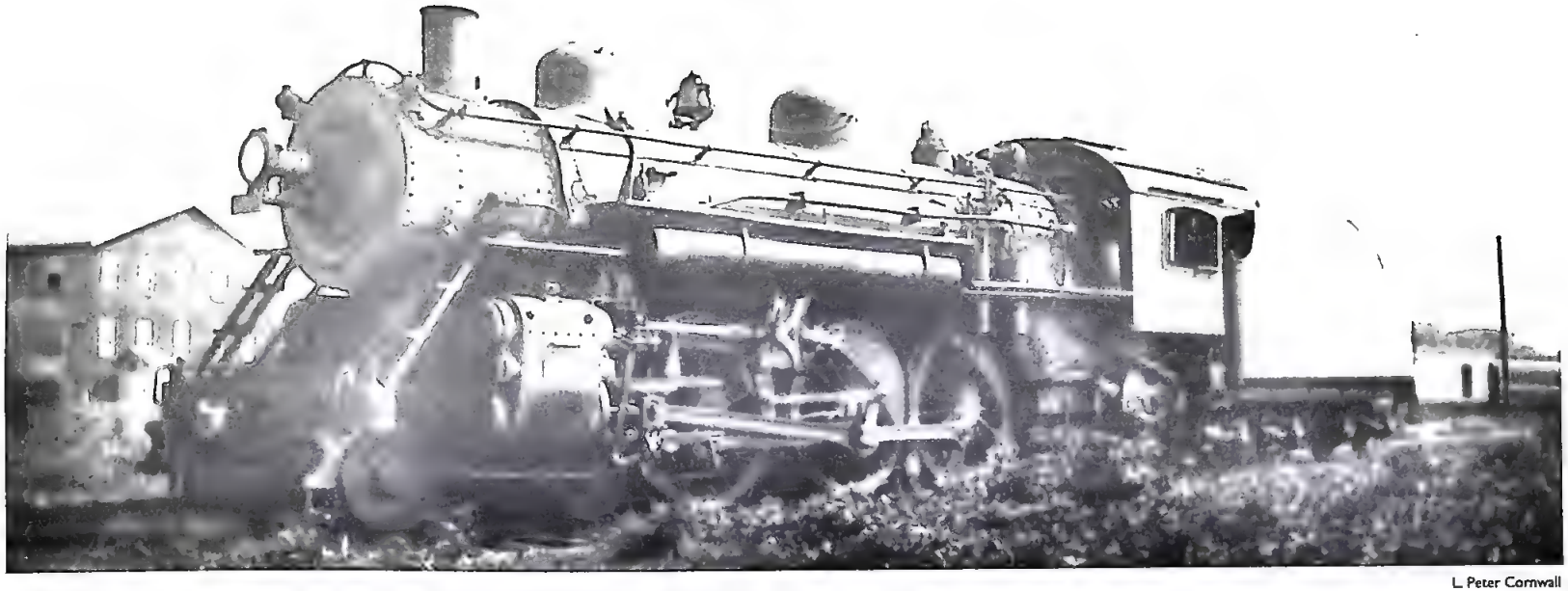
L. Peter Cornwall

Pacific 1006 (above), one of the first Pacific series, waits to leave South Station, Boston with a local on April 22, 1933. Atlantic 1100 (below) is at Boston on September 9, 1937.

H-11100-1111 22x26cyl 79"DR 190BP 25725TF 206200wgt Alco, 1907

Edward L. May





L. Peter Cornwall

Engine 1010, one of the I-1 Pacifics, is at Hyannis, Mass. in Cape Cod passenger service during August, 1933.

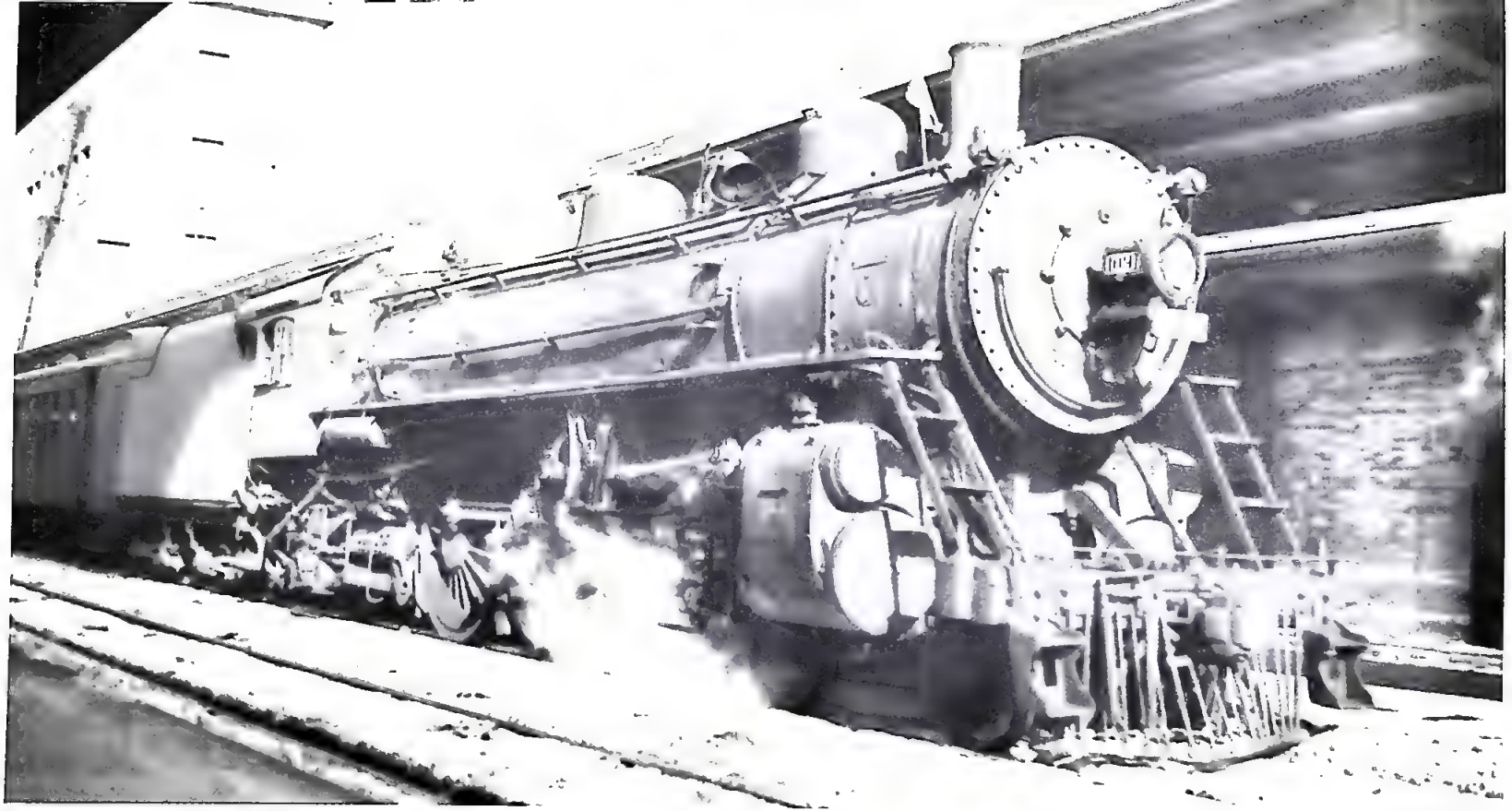
years, thanks to strengthened bridges, the I-4 engines saw improvements in their framing that at once offered greater rigidity and higher weight to make the most of their power.

Nevertheless, these engines were stretched to their limits by the 1930s. Modernized in many ways through the years, their inherent limits were being stressed by tighter schedules and longer trains. In 1937, the New Haven turned to Baldwin for 10 heavy, modern 4-6-4s, I-4 class Engines 1400-1409. These 80-inch drivered speedsters delivered 44,000 pounds tractive force versus the I-4 rating of 37,650, with the added boiler capacity for sustained high speeds on the heaviest Shore Line trains.

The new Hudsons brought some teething problems, the most severe being rough riding at high speed. In common with several other classes elsewhere in the mid-1930s, they suffered from faulty counterbalancing. Typically this came from too much offsetting weight on the main drivers in particular. Once this was identified and revised, the engines proved superlative performers. The virtues of roller bearings on engine axles and a cast steel frame with integral cylinders was soon reflected in lengthened intervals between servicing. Though only 10 in number, the 1400s handled a very large share of Shore Line runs thanks to greater availability. The new Hudsons carried Hancock turbo-injectors rather than the previously favored Elesco feedwater heaters.

Older switchers from absorbed lines, once an important part of the roster, were retired by the end of the 1920s. Between 1902 and 1903, a massive 0-6-0 fleet was assembled that assumed most of the road's yard work. Typical 51-inch drivered engines, they served yards system-wide.

For heavier switching, the 0-8-0 came to the fore, starting with Central New England Engines 10-12, Alco products of 1913. Somewhat larger USRA engines followed in 1920. Engines 3400-3409, class Y-3, typified this highly successful design that came to serve a great many roads. Another 25 such engines, Numbers 3410-3434, came from Schenectady in 1922 and



I-3 1090-1095 24x28cyl 79"DR 200BP 347057TF 246000wgt Baldwin 1913

L. Peter Cornwall

Just six I-3 Pacifics were built with 79-inch drivers for the fastest Shore Line runs when train weights rose beyond the Atlantic type's capacity. Engine 1090, the first of them, is at South Station, Boston, April 22, 1933.

1923. The latter employed Southern rather than Baker valve gear.

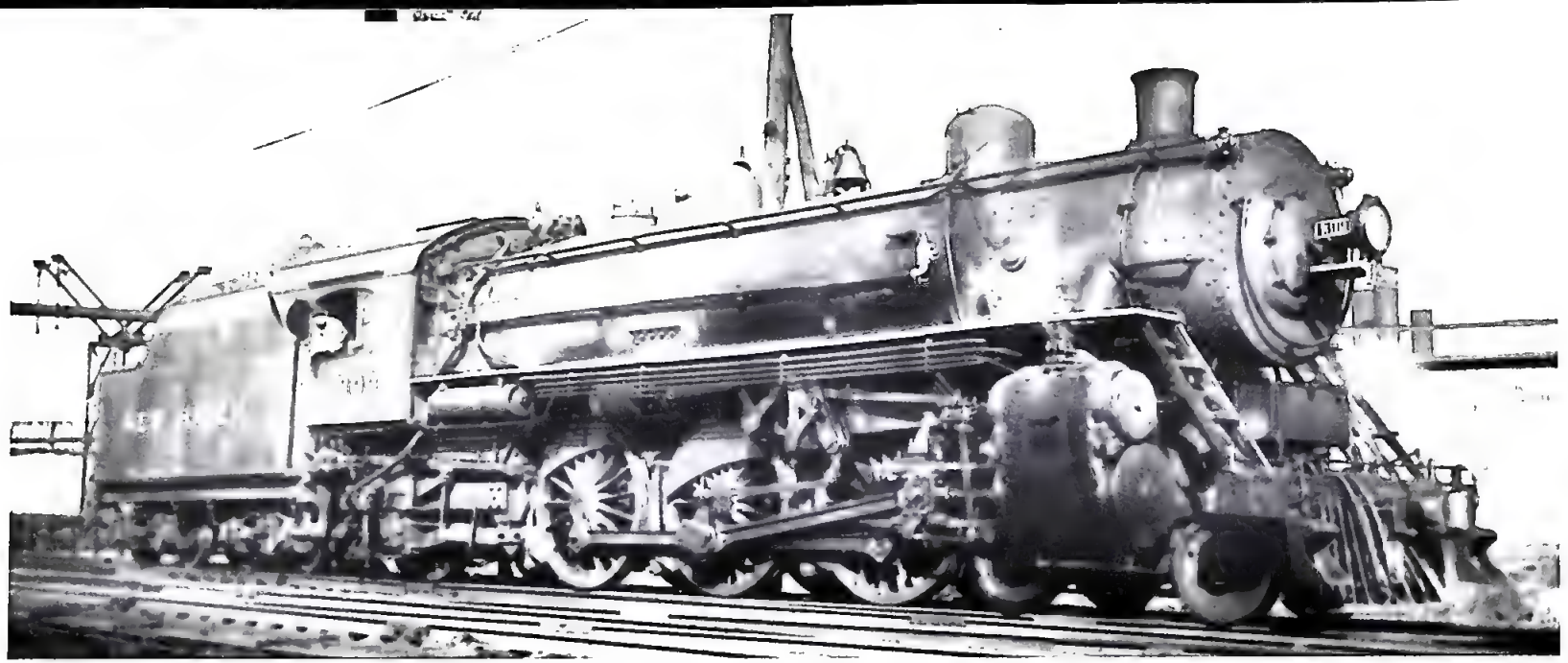
More unusual was class Y-4, the New Haven's first three-cylindered power. Essentially similar to the Y-3 USRA design, Engines 3600-3609 came in 1924 with three 22x28 cylinders rather than the 25x28-inch pair of their predecessors. Six more, Y-4a Engines 3610-3615, arrived in 1927. The smooth power flow suited them well for heavy switching, and the first group's success led the NYNH&H to try the concept on three heavy 4-8-2s delivered in 1926. As noted earlier, final experience with these Mountains revealed maintenance problems that in some measure discounted their other merits in fast freight service.

Like most roads, the New Haven saw the virtues of superheating once practical units became available. Between 1910 and the mid-1920s, many Moguls and Americans plus all of the saturated Atlantics and Pacifics were so equipped. When this was done, Stephenson motion was replaced by one of the available outside valve gears. In the case of the Ten Wheelers, they could be found with Baker, Southern, and Walschaert motion, while Southern seemed the most common on the Moguls and Americans.

L. Peter Cornwall

Pacific 1362, spewing vapor from her cylinder cocks, steps smartly forth from Back Bay Station, Boston with New York-bound Train 11, The Bay State, March 22, 1937.

Most unusual in New Haven steam annals was the remarkable two-car train with its own internal engine for Bridgeport-Waterbury service. A Besler steam engine was applied to a conventional combination car's forward truck. This unit and one coach were moderately streamlined and entered service in 1937. Had the power unit been installed in lightweight equipment, it might have proven satisfactory, but the heavyweight cars were too heavy for the Besler unit and maintenance problems so common to experimental gear limited the train's life to seven years. Its flash boiler and simplified Stephenson valve motion did suggest intriguing possibilities.

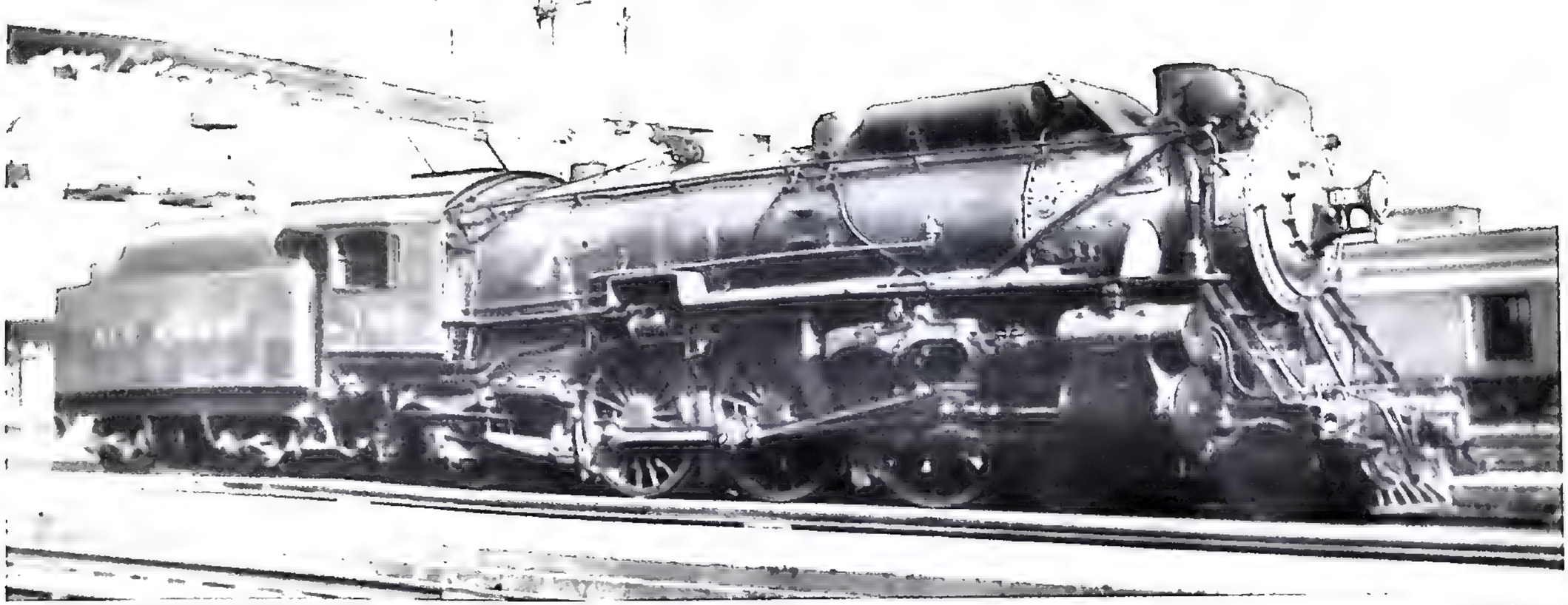


I-2 1300-1349 24x28cyl 73"DR 200BP 37558TF 251500wgt Alco-Brooks 1913

Edward L. May

The I-2 Pacifics worked passenger runs system-wide. Engine 1309 (above) is at Boston on September 6, 1937. A little earlier, on August 8, the 1346 (below) is at New London, Conn.

Edward L. May

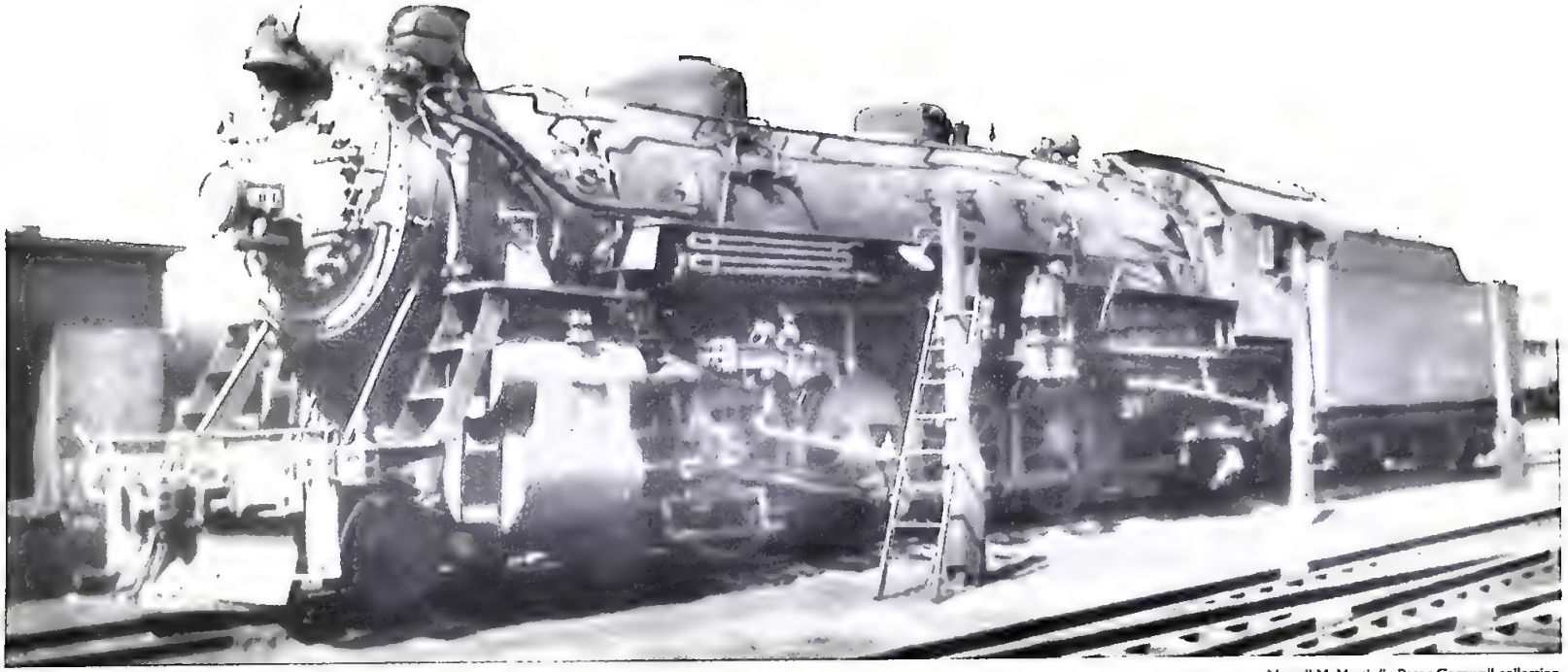


I-4 1350-1399 26x28cyl 79"DR 200BP 40800TF 266000wgt (later 25x28cyl 37650TF 291000wgt) Alco 1916

L. Peter Cornwall

Rulers of the road for many years were the I-4 Pacifics. The 1365 (above, March, 1934) has an original tender on the South Station leads at Boston. 1359 (below, September 6, 1937), also at Boston, is one of many I-4's given larger tenders for use on major Shore Line trains.

Edward L. May



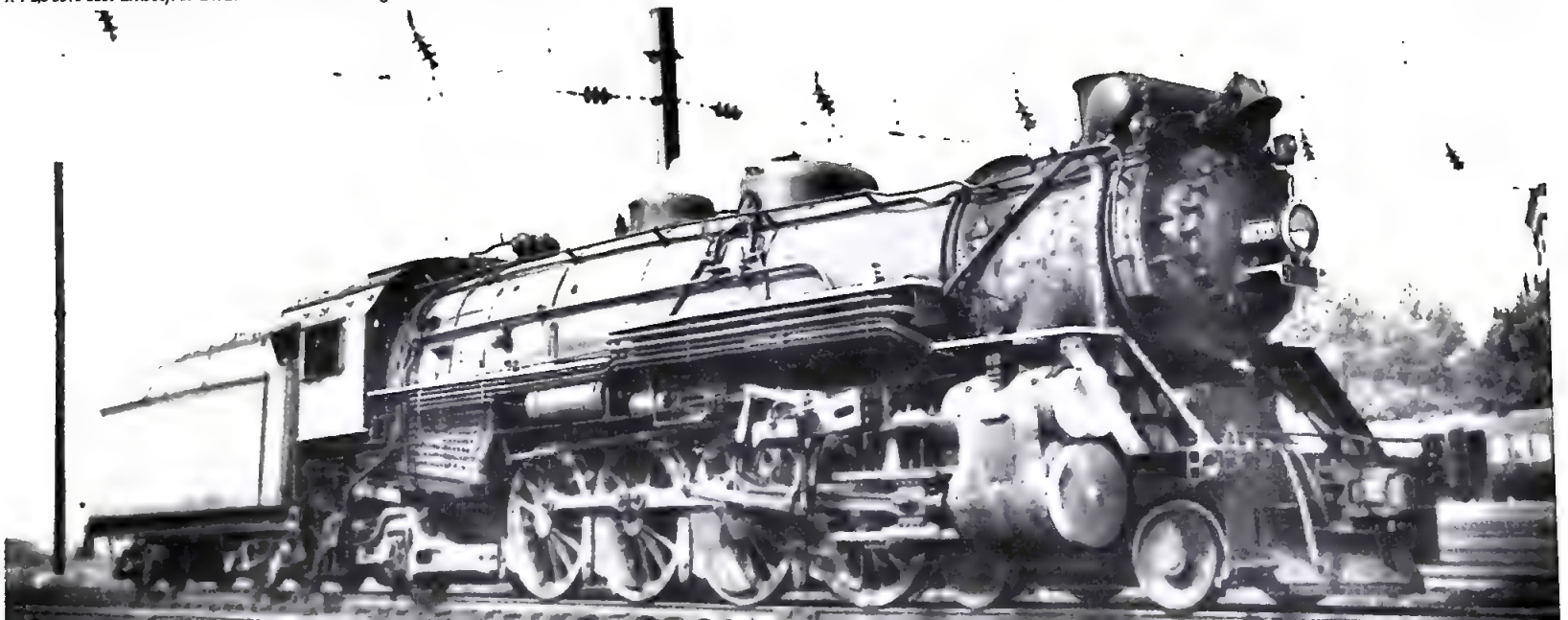
R-1 3300-3309 27x30cyl 69"DR 200BP 53900TF 334000wgt Alco-Richmond 1919

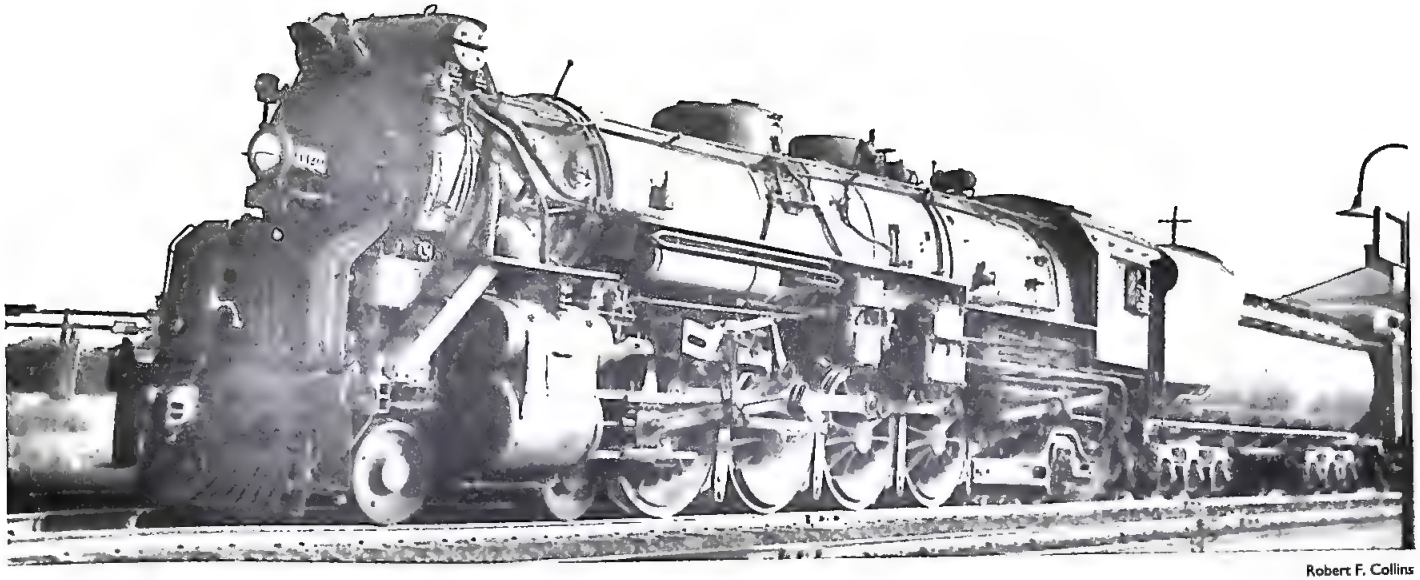
Newell M. Martin/L. Peter Cornwall collection

USRA R-1 Mountain 3306 (above, Providence, R.I., August 30, 1933) differs little from R-1b 3333 (below, New Haven, July 10, 1938) save for the latter's Southern rather than Baker valve gear and a Delta trailing truck in place of the Cole type.

R-1-a,b 3310-3339 27x30cyl 69"DR 200BP 53900TF 334000wgt Alco-Schen. 1920-1924

Robert F. Collins

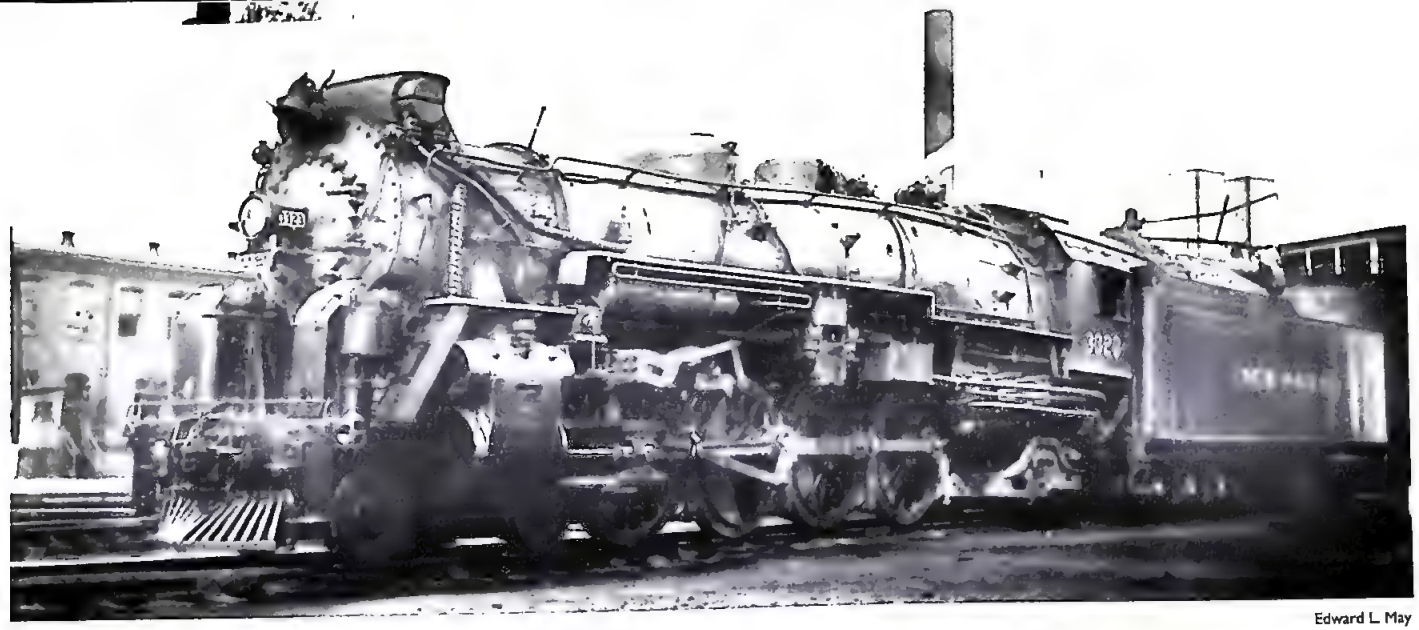




Robert F. Collins

R-1b 3320 (above), carrying Automatic Train Control units for both Shore Line and Hartford routes above the rear driver, pauses with a New Haven-bound passenger train at Berlin, Conn. R-1b 3329 (below) ambles through Medfield Junction, Mass. with Train PC-2 in 1948.

Wayne R. Brumbaugh



Edward L. May

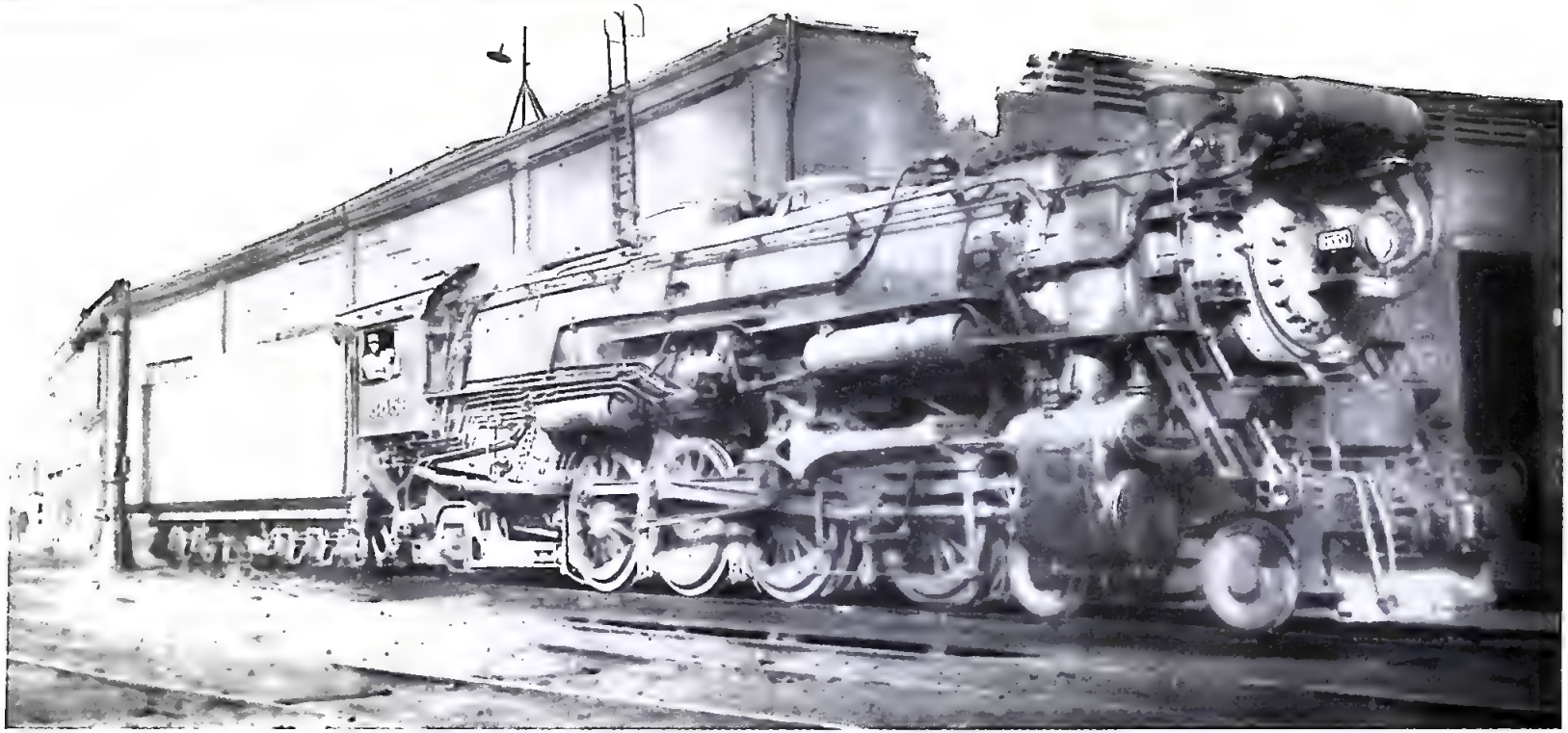
Tender switches were common on the New Haven. R-1b 3323 (above, Cedar Hill Yard, New Haven, October 11, 1936) has a large tender assigned. Below, with Baker valve gear replacing its Southern motion, 3323 now has a smaller original-style tender while crossing the Thames River Bridge at Groton, Conn. on Train OB-8 in 1946.

Wayne R. Brumbaugh

Edward L. May

R-2-a 3501-3507 27x30cyl 69"DR 265BP 68000TF 362500wgt Alco 1926

Heavy R-2 Mountain 3507 takes water at New Haven's Cedar Hill Yard, October 11, 1936.

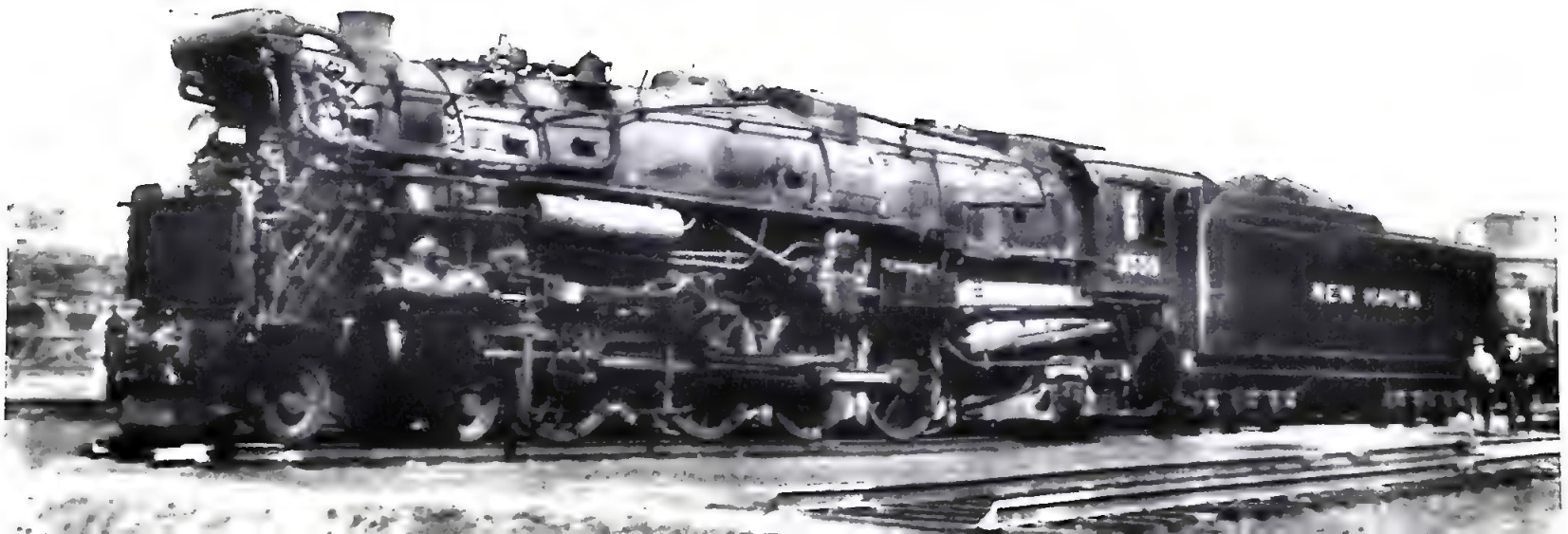


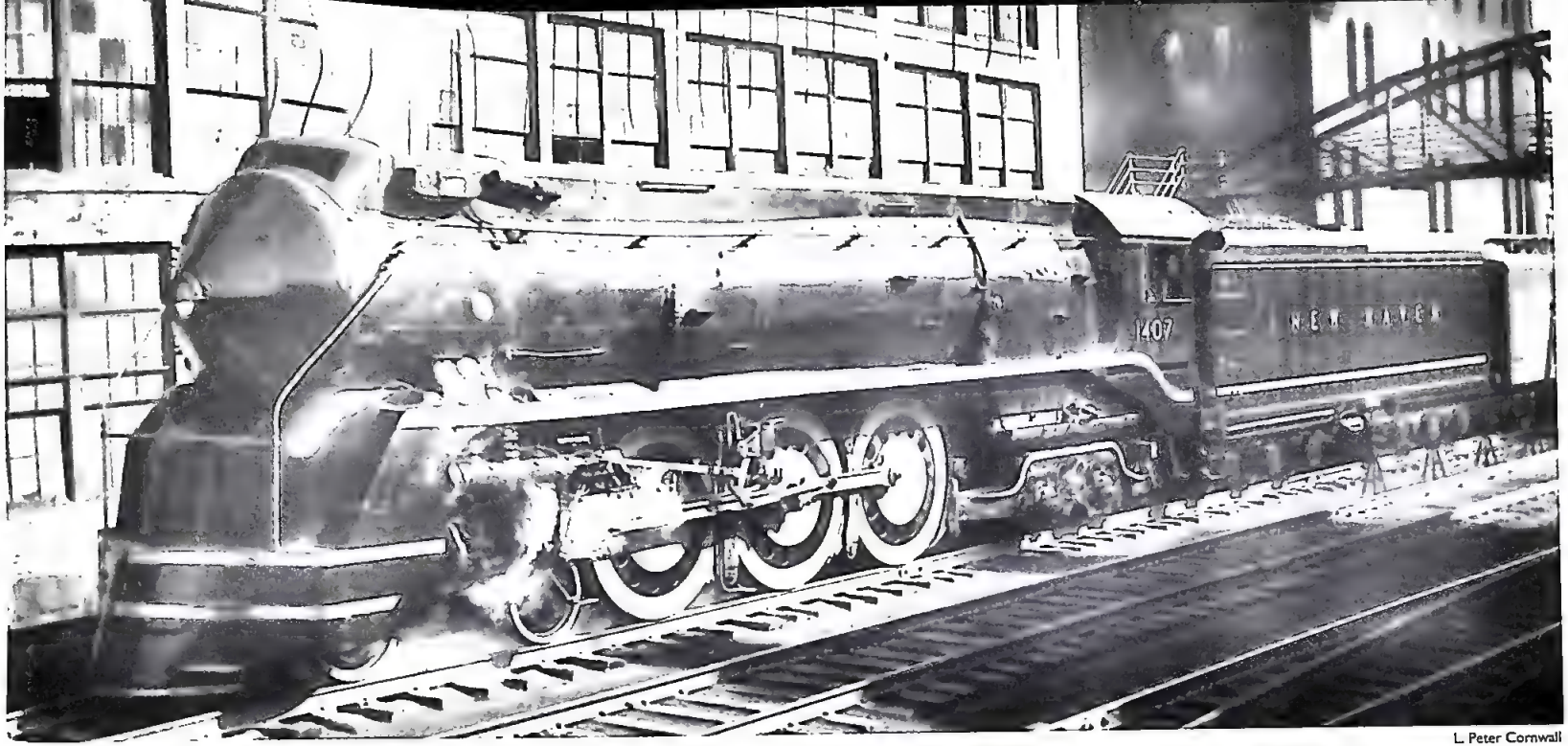
R-3-a 3553-3562 (3)22x30cyl 69"DR 265BP 71000TF 379000wgt Alco 1928

Edward L. May

Three-cylinder Mountain 3559 is at Cedar Hill Yard on September 6, 1937 (above) and again below in 1939.

Jack W. Farrell

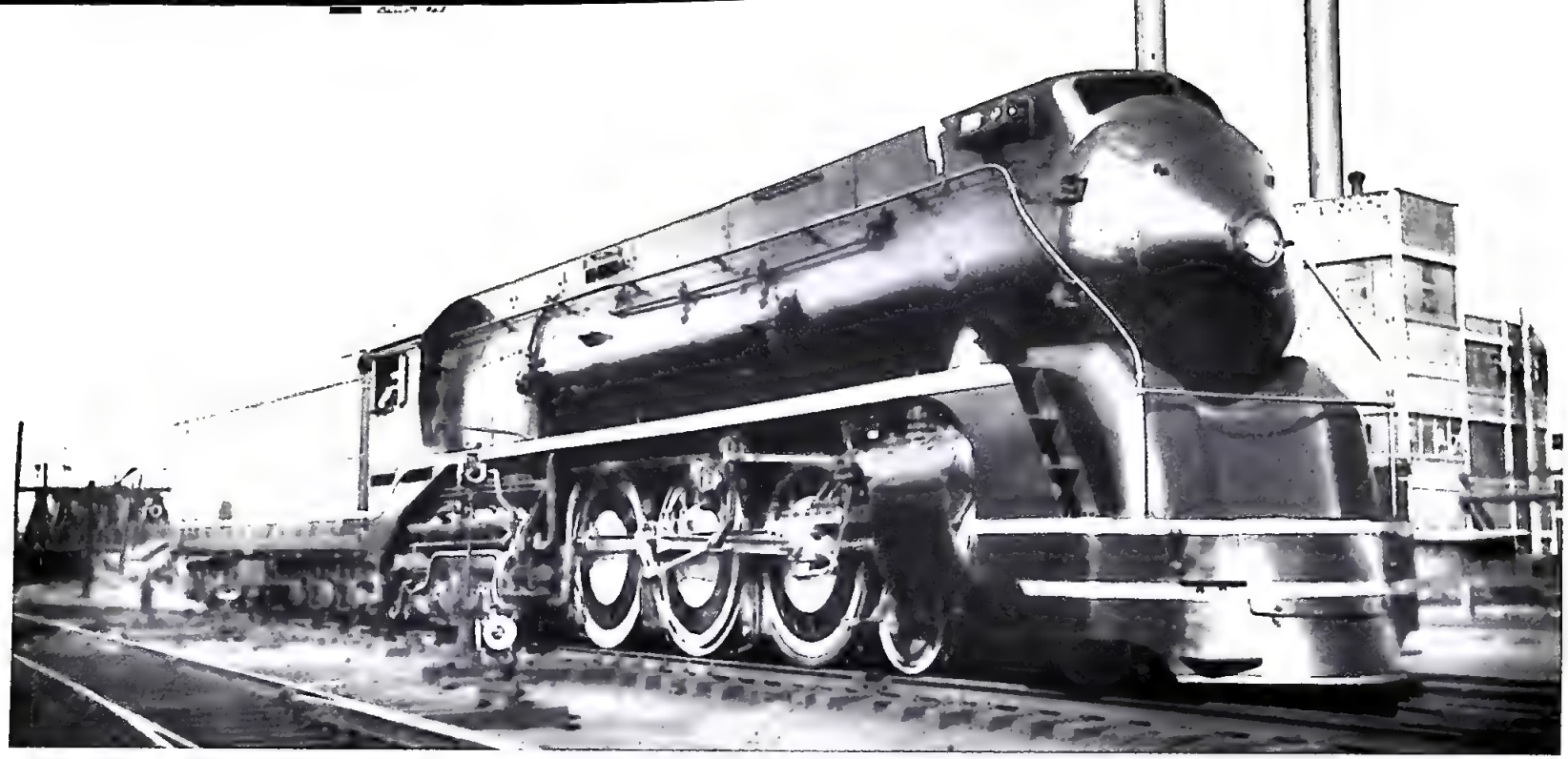




L. Peter Cornwall

Hudson 1407 (above) accelerates Train 11, The Bay State, out of Back Bay, Boston in May, 1937. Hudson 1408 (below) dashes through Readville, Mass. with the same run on May 31, 1937, hauling a combine, four coaches, Diner, Parlor, and Parlor- Observation car.

William Lichtenstern/Jack W. Farrell collection

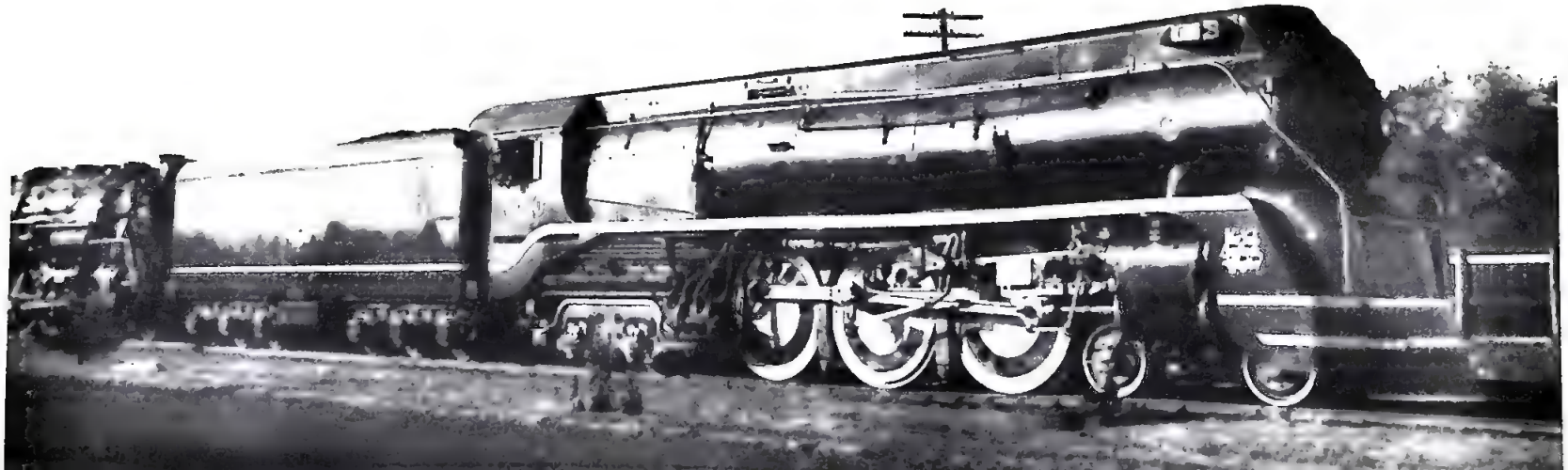


I-5 1400-1409 22x30cyl 80"DR 285BP 44000TF 365300wgt Baldwin 1937

Edward L. May

At Boston, September 6, 1937 (above), initial Hudson 1400 wears the original Baldwin paint scheme. By October 17 at Readville (below), the 1400 carries an NYNH&H script trade mark on the tender and ahead of the cylinder on each side.

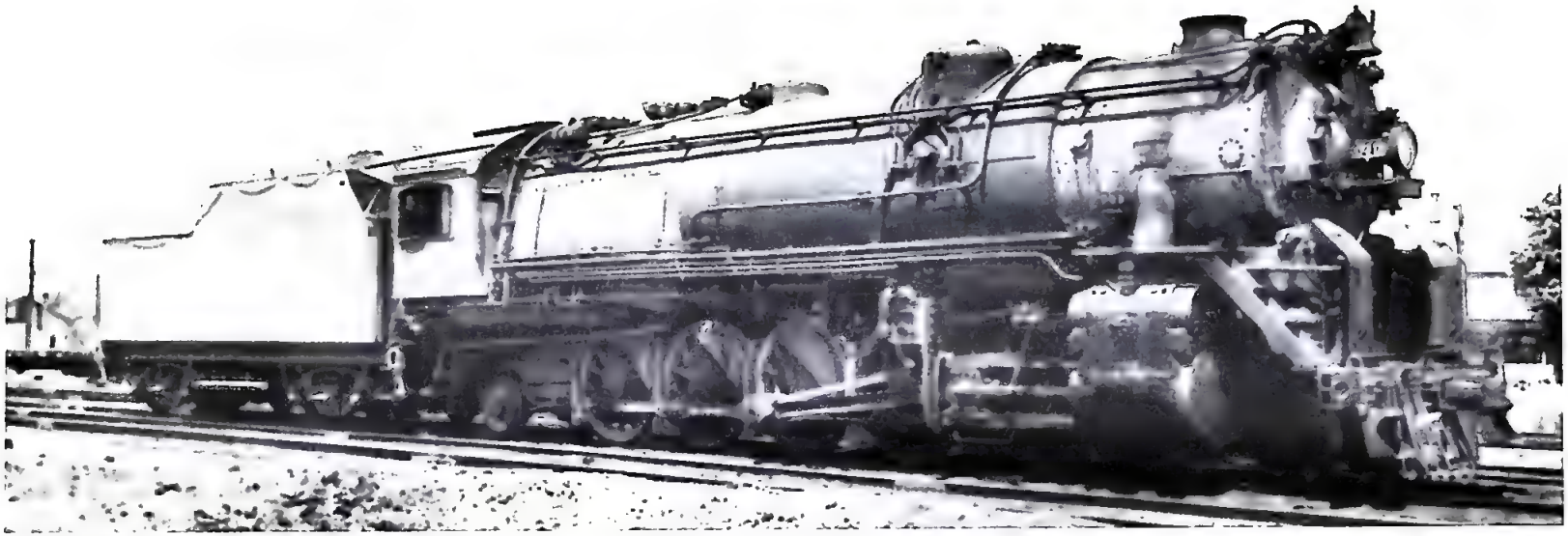
George E. Votava



George E. Votava

This unusual Besler steam-powered train worked several Bridgeport-Waterbury runs for seven years. Cars 9210-9211 pause above as Waterbury-bound Train 456 at Devon, Conn., March 1, 1936. Below, Bridgeport-bound Train 443 leaves Derby, Conn. on September 6, 1946 with the engine crew working from the trailing car's remote control cab.

George E. Votava



L-1 3200-3249 30x32cyl 63"DR 185BP 72000TF 361000wgt Alco 1918

George E. Votava

Santa Fe types at Hopewell Junction, N.Y.: The 3246 (above, July 14, 1940) is the only engine of the class not given an Elesco feedwater heater, though later equipped with a Hancock turbo-injector. Elesco-equipped 3229 (below, May 17, 1947) has just descended the long grade from Whalley Lake with a westbound manifest.

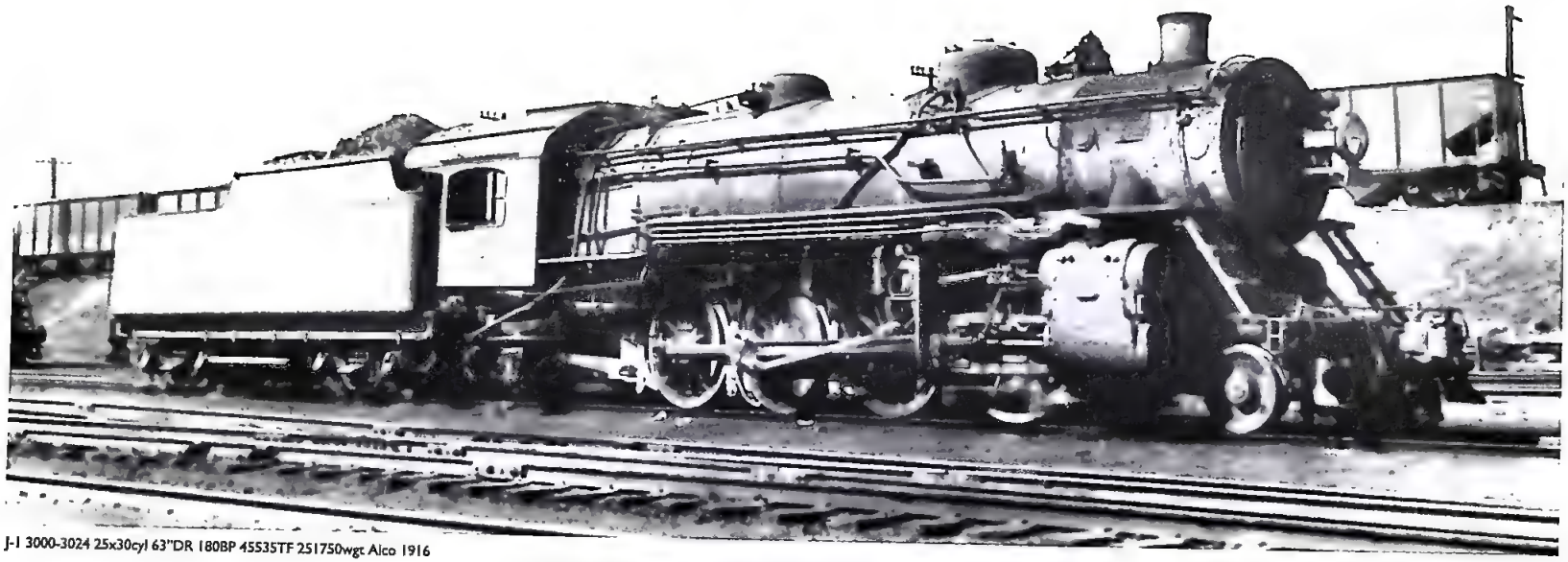
George E. Votava

George E. Votava

After pausing to pick up a pusher at Hopewell Junction, Engine 3203 heads toward the long grade to Whalley Lake and Reynoldsville Summit on September 5, 1938.

Robert F. Collins

After climbing upgrade from Hopewell Junction, 3212 (prior page) picks up the pace eastbound with 76 cars at Reynoldsville Summit, N.Y. Pusher 3213 (above) will soon detach and return to Hopewell Junction.

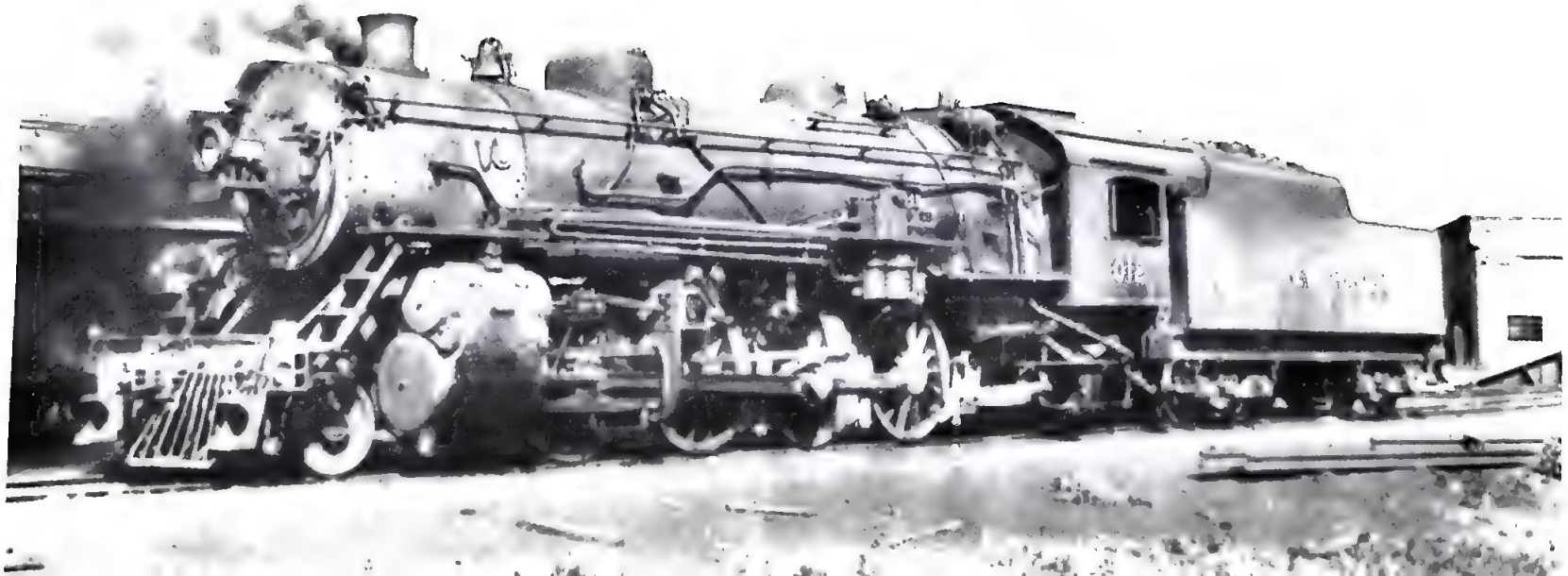


J-1 3000-3024 25x30cyl 63"DR 180BP 45535TF 251750wgt Alco 1916

Jack W. Farrell

Light Mikado 3012 sits above at the Middletown, Conn. Engine Terminal in 1939 and, below, comes off the Hyannis, Mass. turntable, August 23, 1934.

L. Peter Cornwall

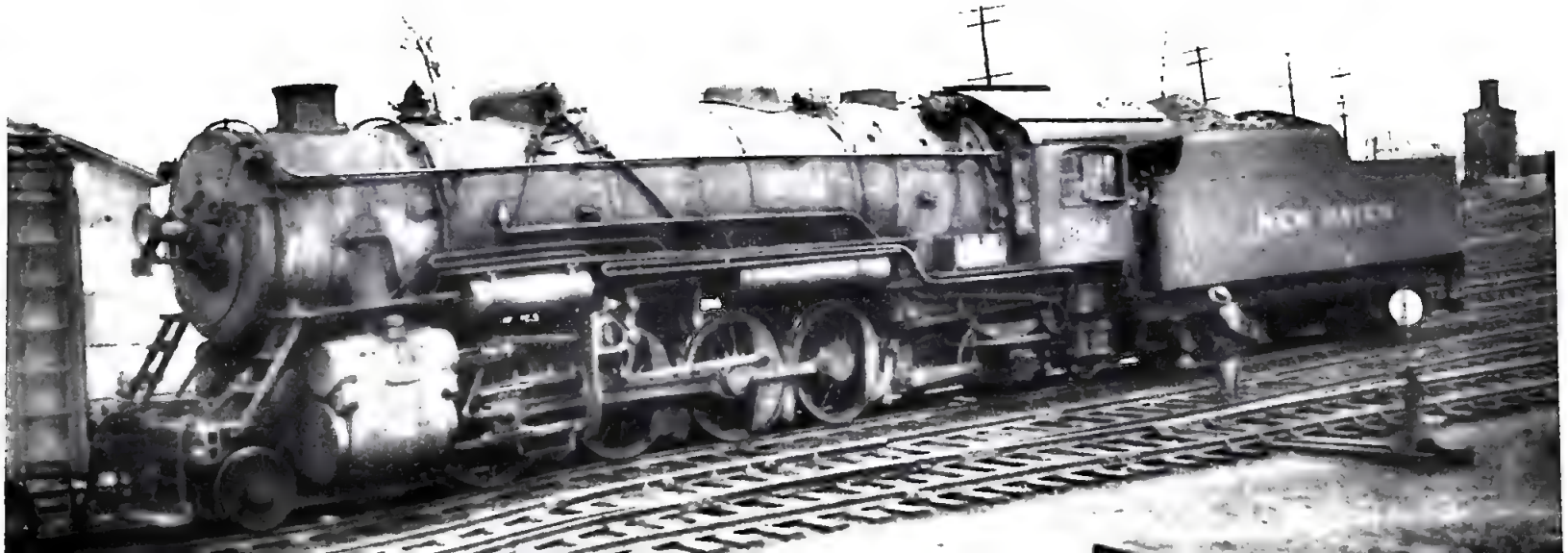


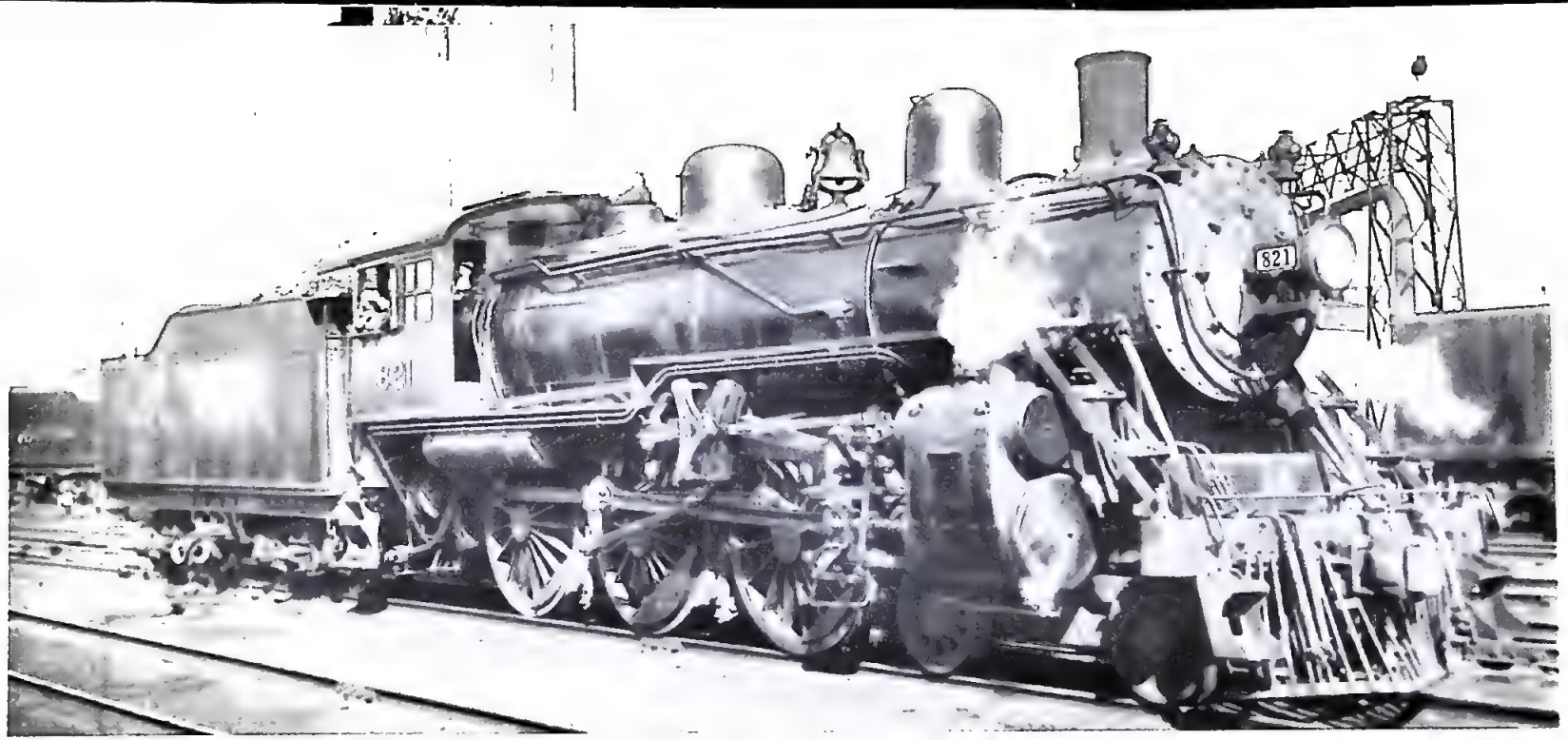
J-2 3100-3107 26x32cyl 63"DR 200BP 58372TF 309600wgt Alco 1916

L. Peter Cornwall

Light Mikado 3013 (above) pauses at East Hampton, Conn. with the Air Line local freight from New Haven. Heavy Mikado 3101 (below) switches at East Hartford, Conn., April 4, 1934.

L. Peter Cornwall





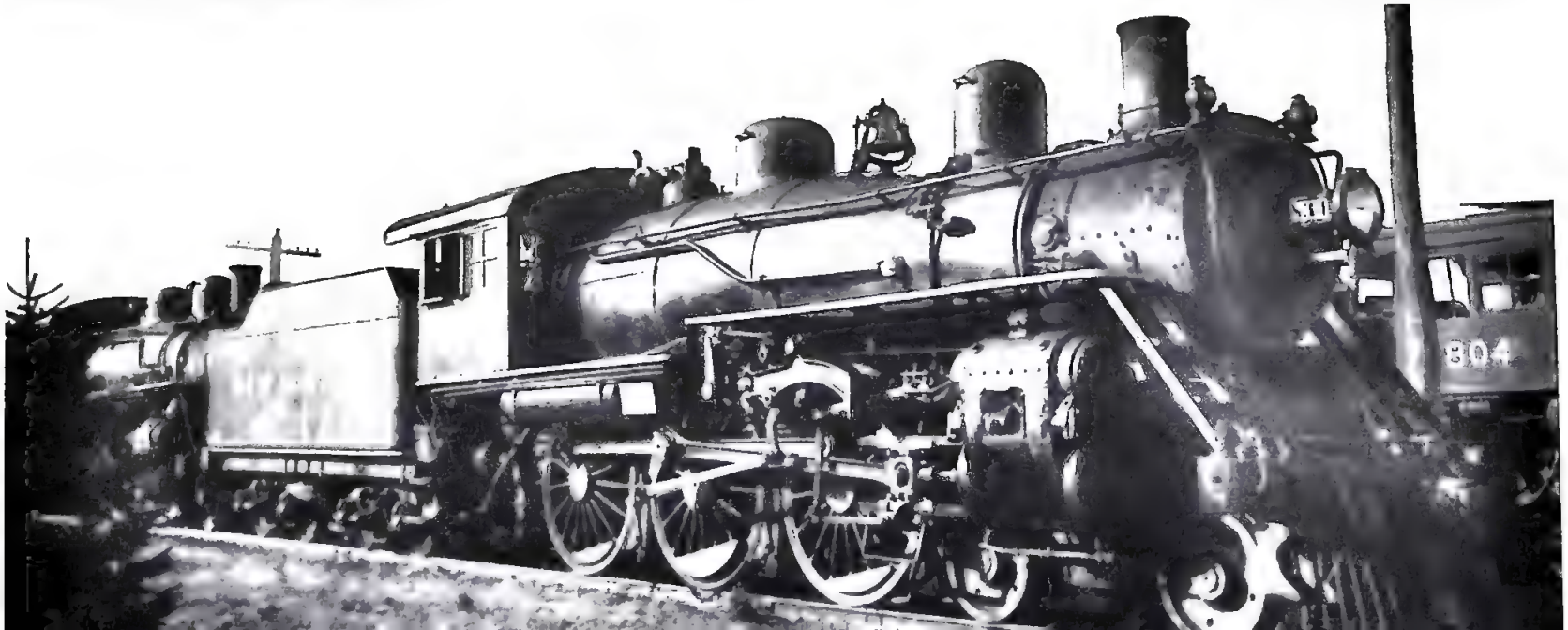
G-4 800-849, 850-859 22x26cyl 73"DR 190BP 27840TF 174860wgt Baldwin 1904, 1905, 1907

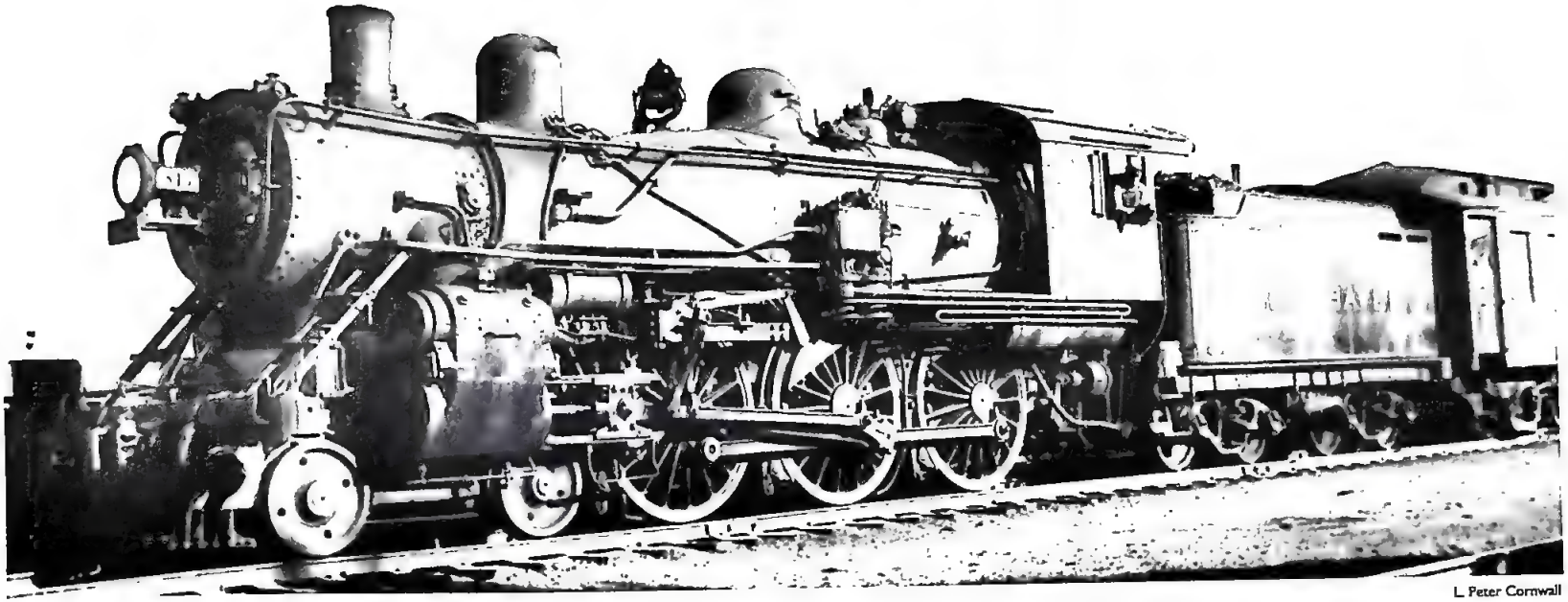
Edward L. May

Rebuilt 4-6-0 821 (above, Boston, September 9, 1937) has Walschaert motion, while 834 (below, Readville, Mass., October, 1937) carries Baker valve gear.

G-3 960 19x26cyl 57"DR 170BP 23800TF 125000wgt Rhode Island, 1903

William Lichtenstern/Jack W. Farrell collection

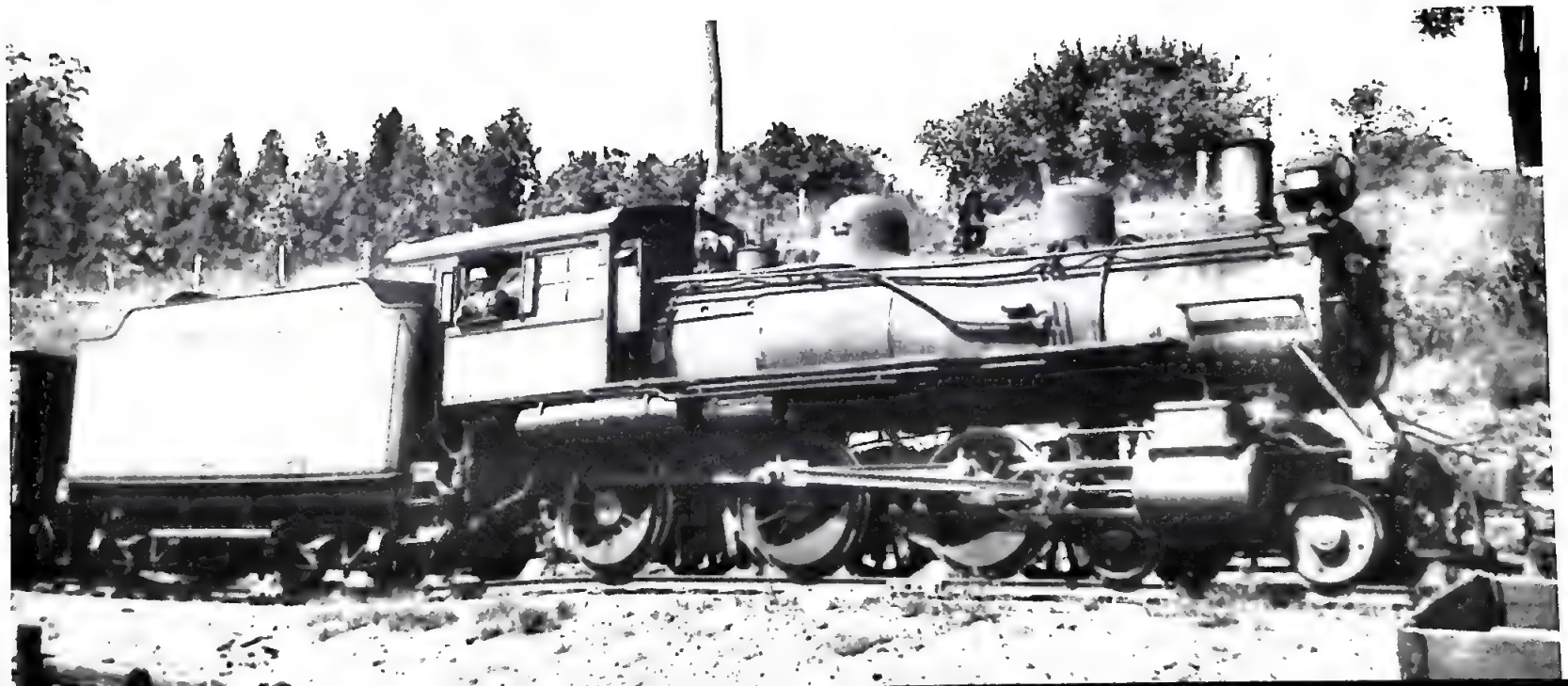


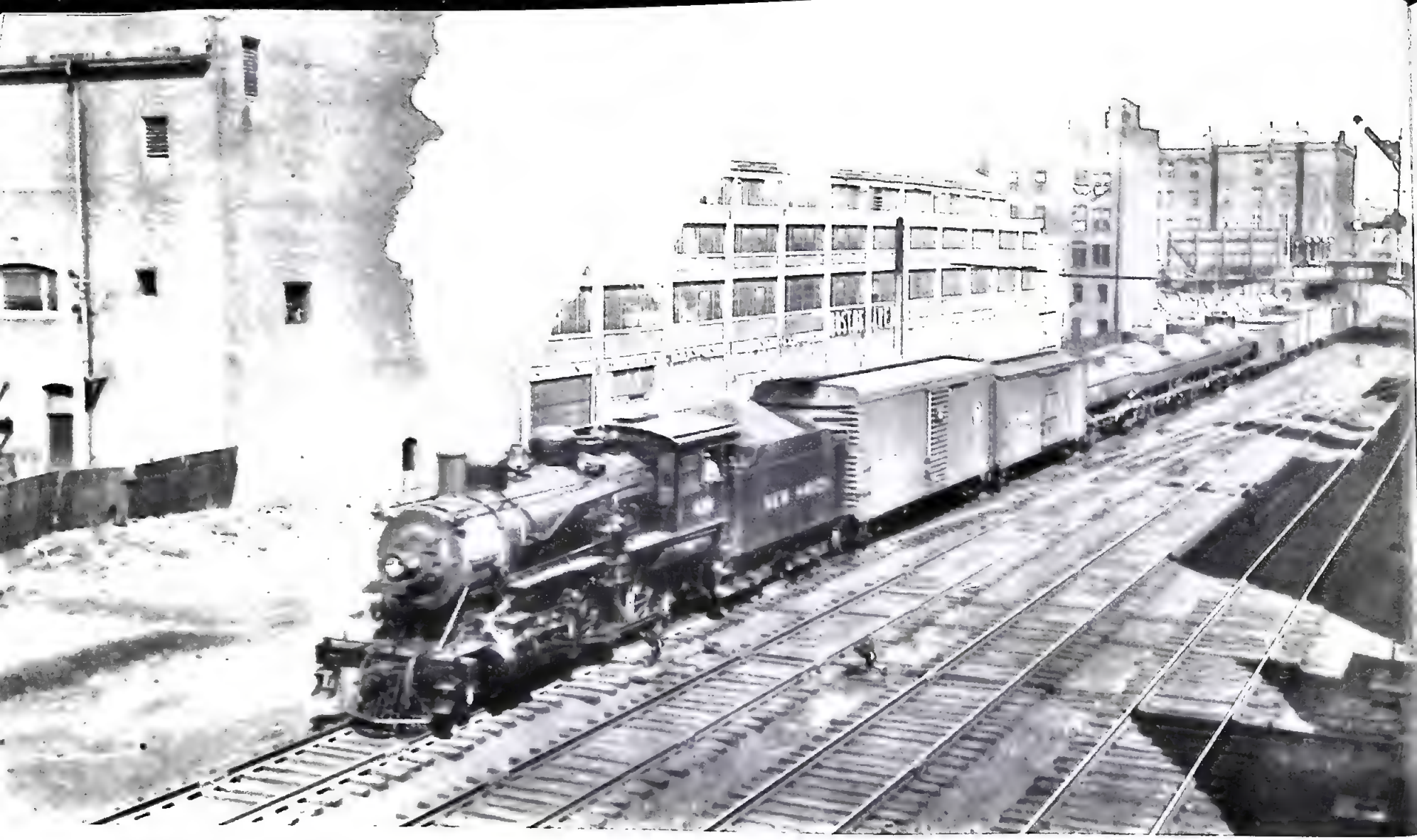


L. Peter Cornwall

Rebuilt 4-6-0 843 (above ca. 1935), on a Cape Cod passenger run, now carries Southern valve motion. Light Ten Wheeler 960 (below), at Woonsocket, R.I. in August 1933, is one of two such engines retained for a branch with a severe bridge weight limit.

L. Peter Cornwall





L. Peter Cornwall

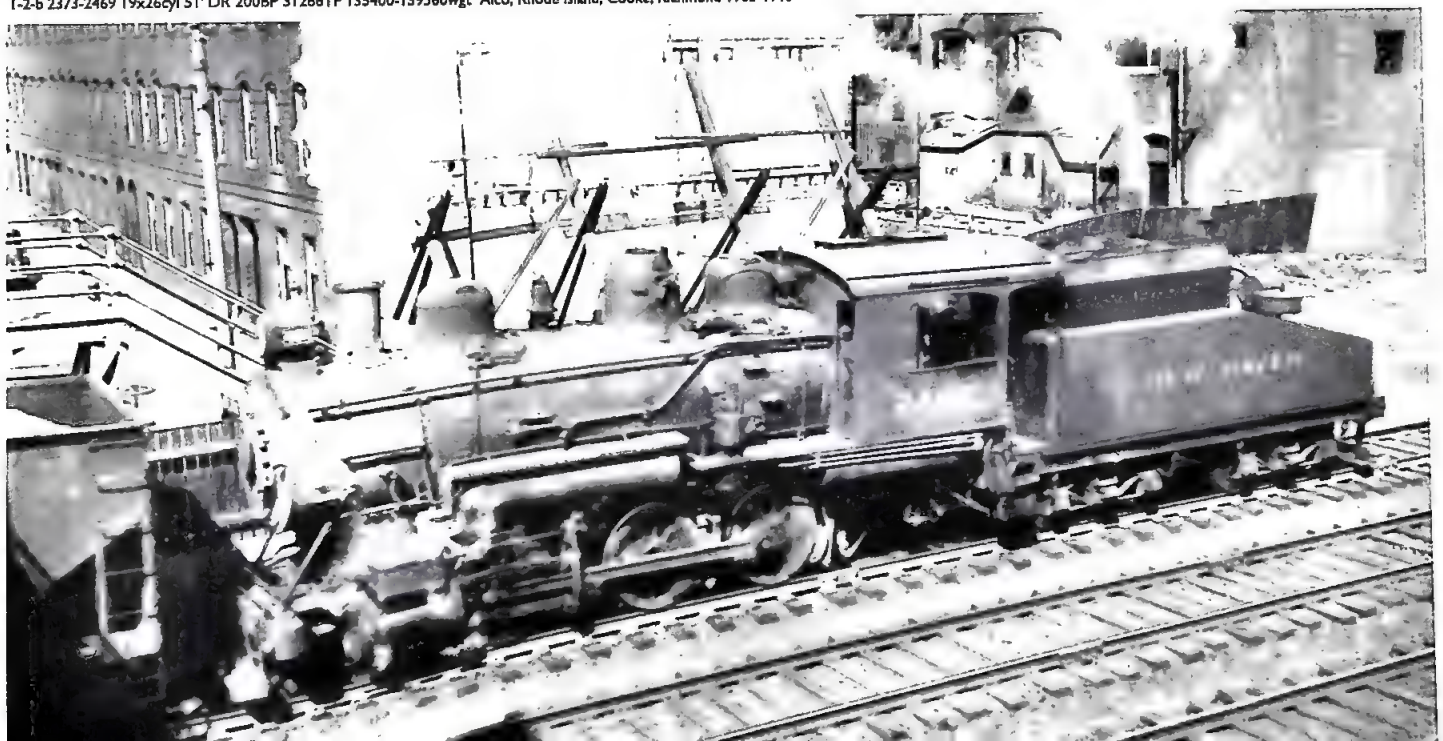
Mogul 420, approaching Gainsborough Street, Boston in October, 1935, is one of the series that remained unsuperheated, retaining her slide valves and Stephenson motion.

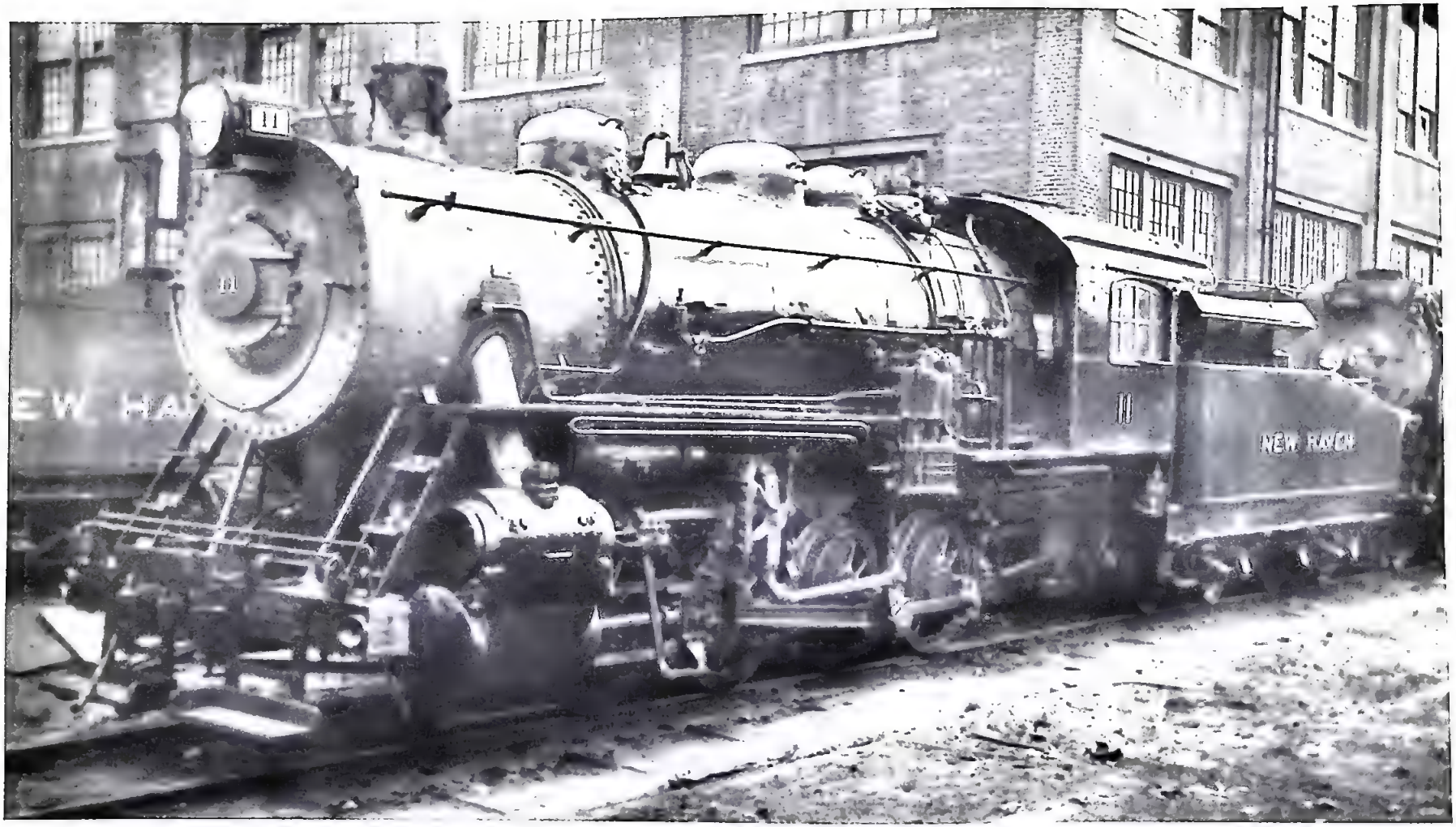
L. Peter Cornwall

Busy times at Boston's Gainsborough Street. West of Back Bay Station, ex CNE 2-8-0 157 (above) handles local work on March 2, 1937, as does 0-6-0 Switcher 2442 (below) in October, 1935.

T-2-b 2373-2469 19x26cyl 51"DR 200BP 31286TF 135400-139560wgt Alco, Rhode Island, Cooke, Richmond 1905-1913

L. Peter Cornwall

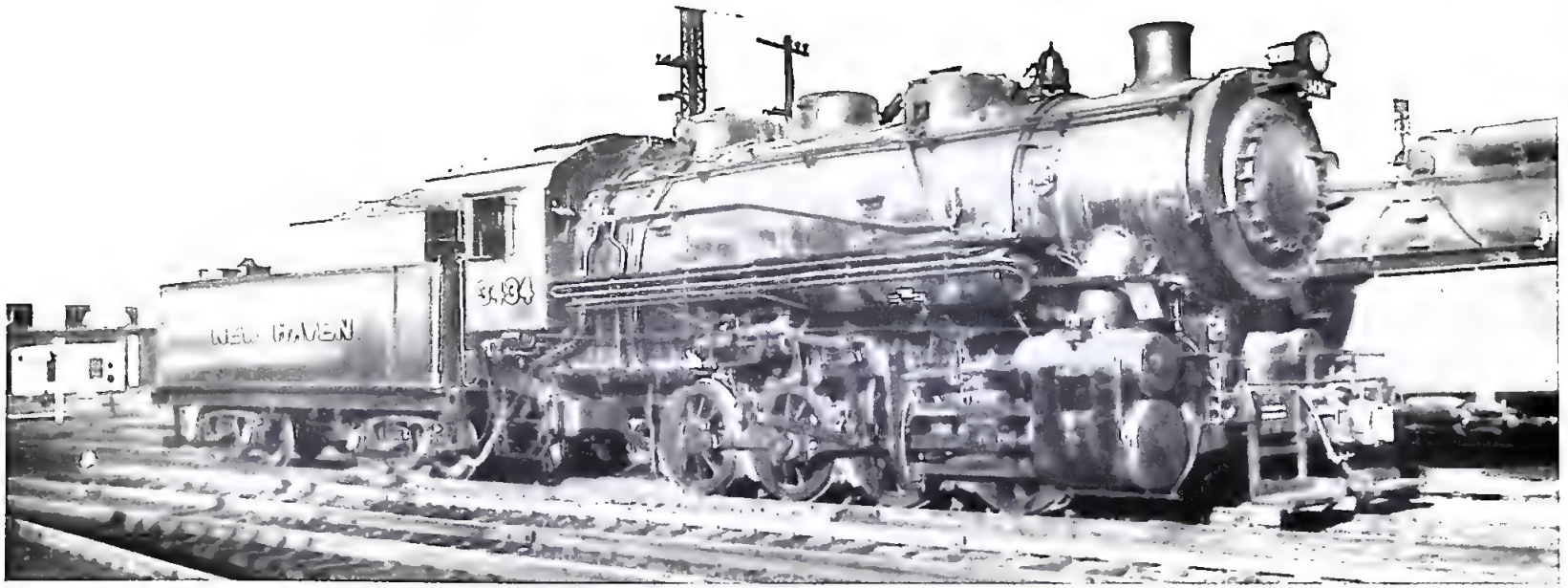




Y-2 10-12 22x28cyl 51"DR 200BP 45200TF 202500wgt Alco 1913

L. Peter Cornwall

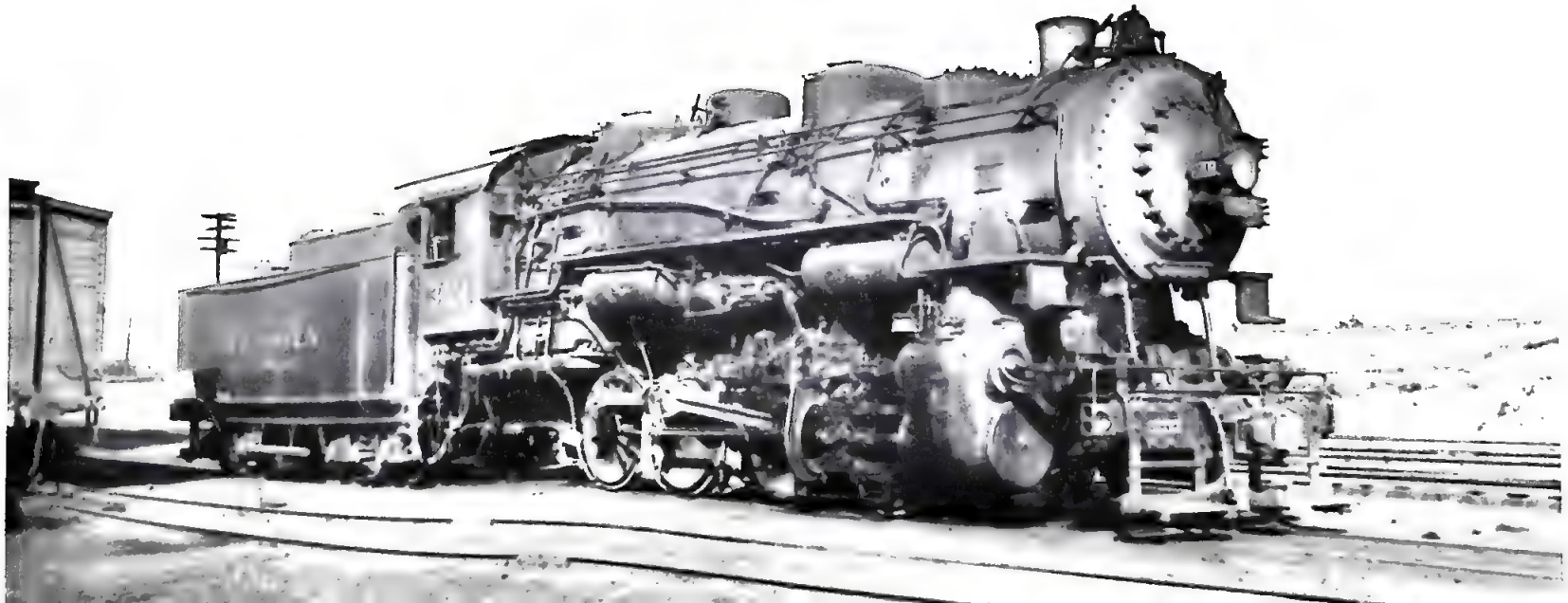
0-8-0 11, one of three built for the Central New England, has just emerged from Readville Shops on May 24, 1936 and will soon be back at work.

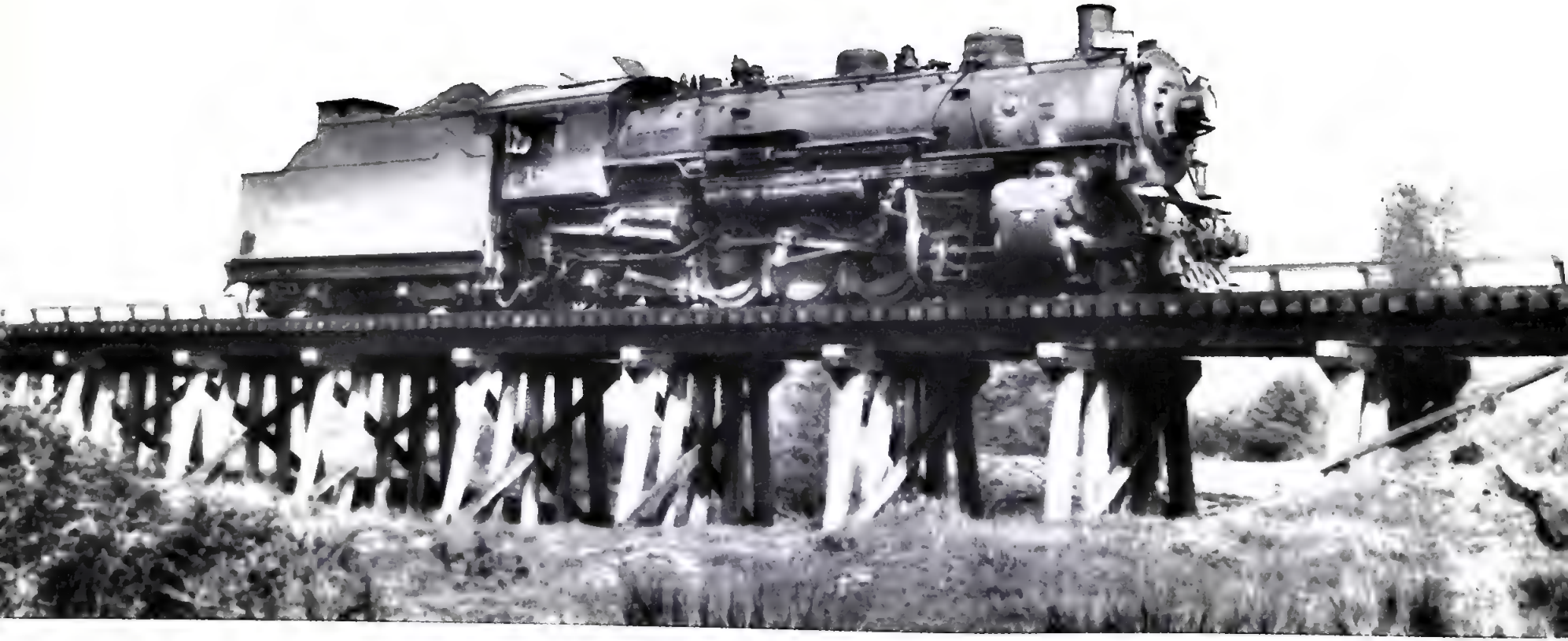


Y-3 3400-3434 25x28cyl 57"DR 175BP 51000TF 247000wgt Alco 1920-1923 George E. Votava

Engine 3434 (above, New Haven, August 25, 1937) is one of the road's USRA-style 0-8-0s. Three-cylindered 3614 (below, Maybrook, N.Y., September 12, 1937) is one of a well-regarded series on the New Haven.

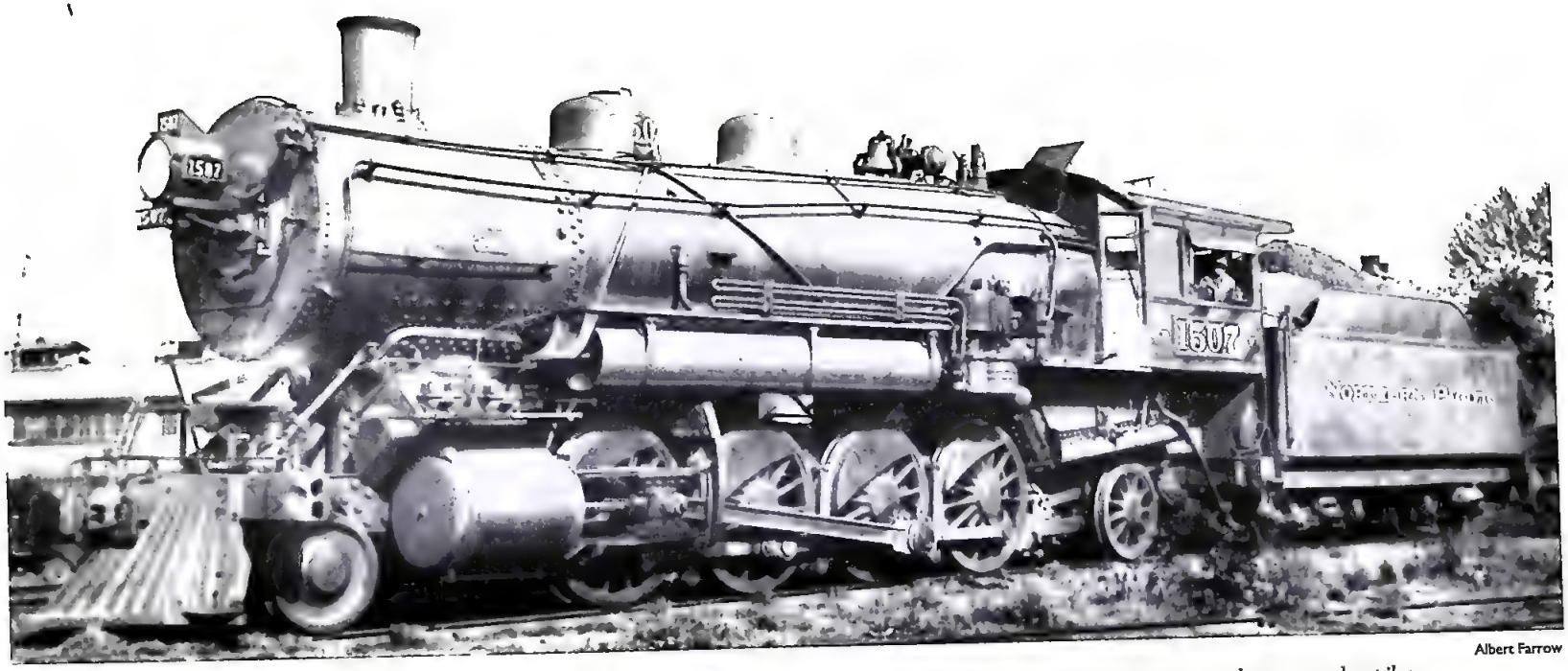
Y-4-a 3610-3615 (3)22x28cyl 57"DR 200BP 60600TF 247000wgt Alco 1927 George E. Votava





Heavy Mikado 1800 sits astride a Northern Pacific timber trestle at Bromart, Wash., August 25, 1948.

Albert Farrow



Albert Farrow

At Auburn, Wash., October 3, 1937, Brooks-built Mikado 1507 is still a saturated engine with Stephenson motion and an original-type wooden pilot.

NORTHERN PACIFIC MIKADOS

Mikado type locomotives played a long and lustrous role on the Northern Pacific. Early in the 1900's, when 2-8-0's were the primary freight power elsewhere, the NP bought 2-8-2's 1500-1659, class W, from Brooks. Delivered during 1904-1907, these 63-inch drivered engines offered somewhat greater tractive force and far better steaming capability than most contemporary freight power. A fleet of smaller but similar 2-6-2 Prairie types soon joined them to work the easier grades of the NP s eastern region.

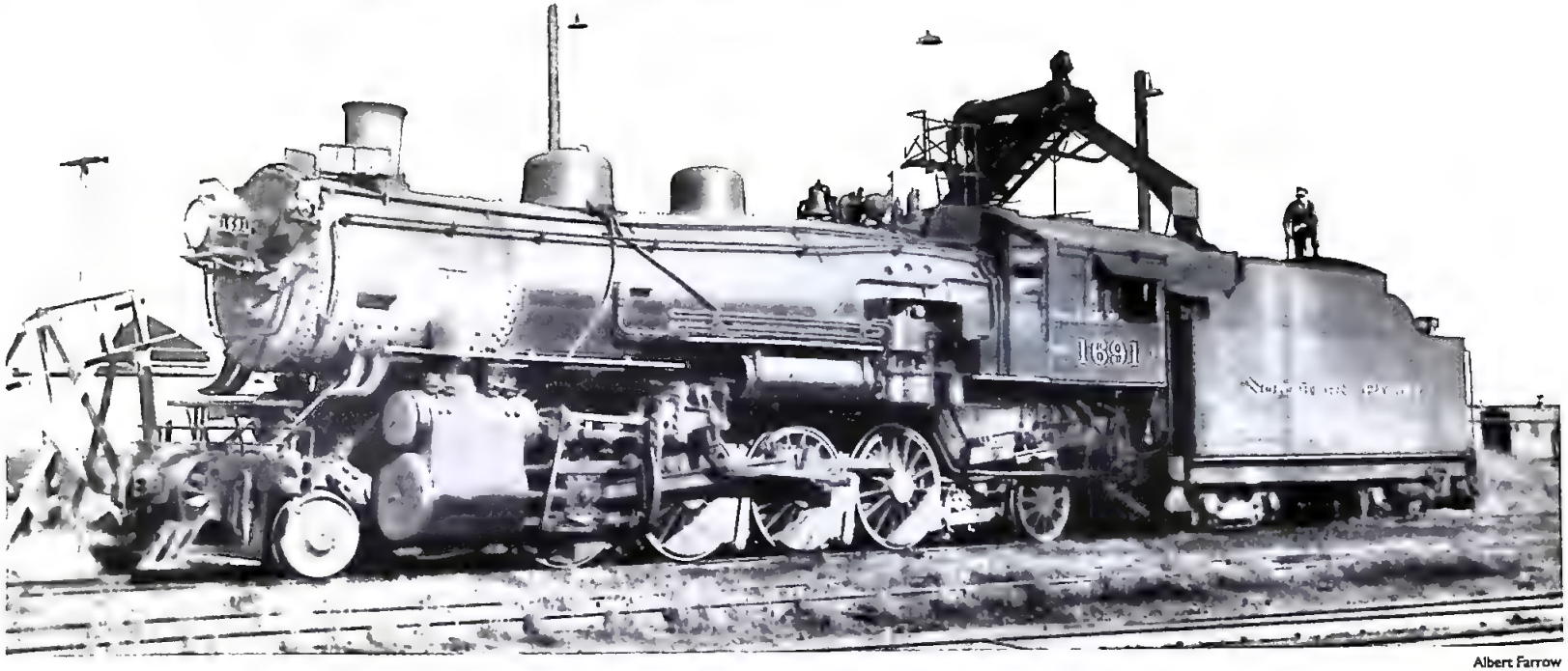
In this pre-superheater era, the road also turned to compounding for some of its Mikados, receiving 20 tandem compounds, ultimately class W-2, Numbers 1900-1919, in 1905. As elsewhere, maintenance costs and the advent of superheating ended Northern Pacific compound development. In 1912, class W-2 engines were simple, superheated, and given Walschaert valve motion in place of the Stephenson gear standard on the W-class engines which they largely resembled.

Later years saw many of the W's superheated, but otherwise changed little. Cut-back tenders and footboards in place of road pilots were given to class members assigned to switching service. For more than four decades these well-balanced engines worked as general utility power long after larger, more

Ray W. Buhrmaster

Engine 2501 (above), switching at Glendive, Mont. on June 30, 1953, belongs to the W-4 class that were rebuilt in the company shops from Brooks 2-6-2s. In most respects this group differed little from the initial W class. The 1516 (below), taking water at Pasco, Wash., April 30, 1945, is now superheated and has a cast pilot.

Albert Farrow



Albert Farrow

W-2 Engine 1691, taking coal at Auburn, Wash., May 1, 1954 generally resembles the original W-class, but was delivered superheated and equipped with Walschaert valve motion. The inside bearing trailing truck was still retained. Engines 1676 and 1692 of this group became Alaska Railroad 751-752 in 1942 and 1943.

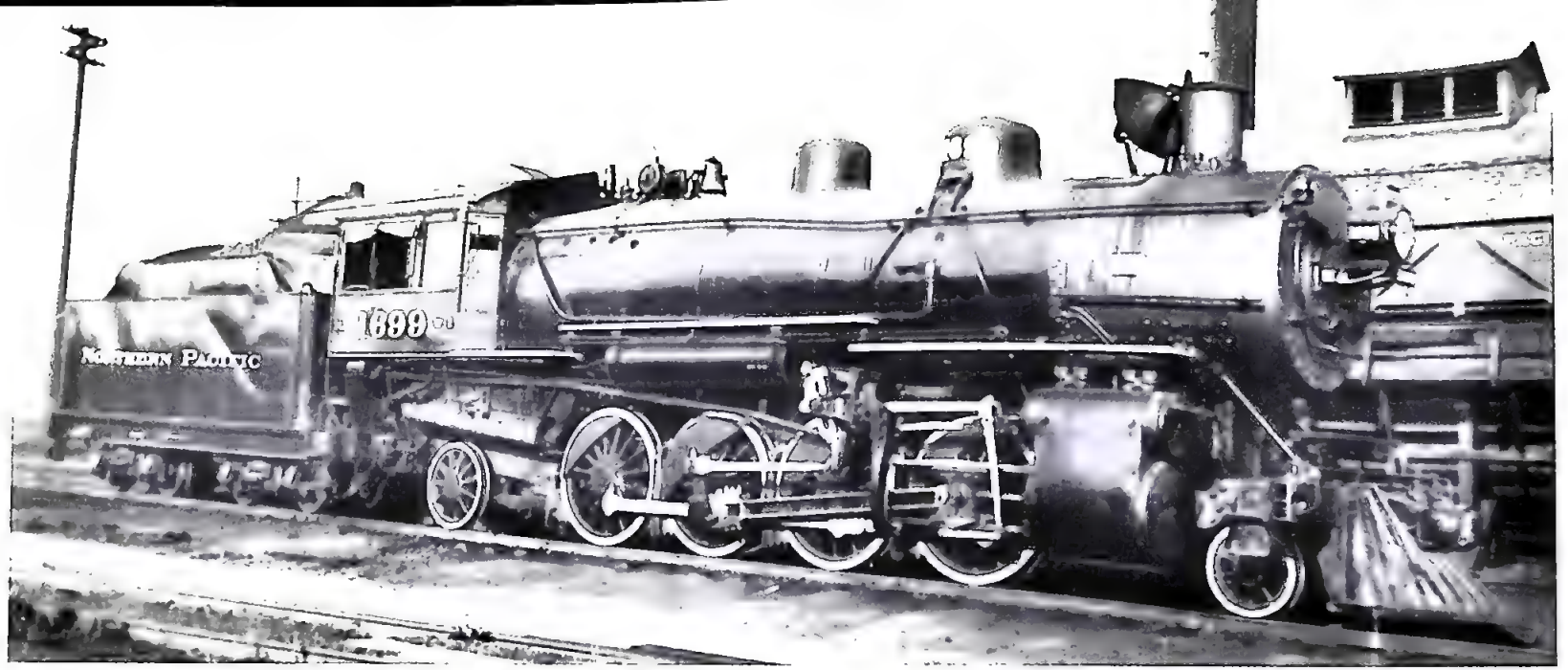
modern locomotives assumed the heavier main-line duties.

In 1910, Class W-1, Engines 1660-1699 arrived. Similar to the W series, they differed in having superheaters and 25x30 rather than 24x30 cylinders. This lifted their tractive force rating from 46,600 to 56,600 pounds. They were the final group of engines derived from the initial W-class pattern.

Three years later, a husky new Mikado design came to the Northern Pacific. Some 35 tons heavier than the W engines, the W-3 Mikados supplied an impressive 63,460 pounds tractive force. More modern Cole trailing trucks replaced the inside-bearing radial trucks of the W class. Well received, further orders delivered in 1917, 1918, and 1920 brought the class total to 135 engines numbered 1700-1834. They could be found in main line freight service the length and breadth of the Northern Pacific network, though later years saw them displaced increasingly by Articulateds in mountain service.

Finally, Mikados 1835-1859 joined the fleet in 1923 as class W-5. Though similar to the W-3 class, the 1800s were booster-equipped, lifting starting tractive force to 75,240 pounds. Among notable differences were their smokebox-mounted air pumps and low headlights, setting them visually apart from their W-3 predecessors.

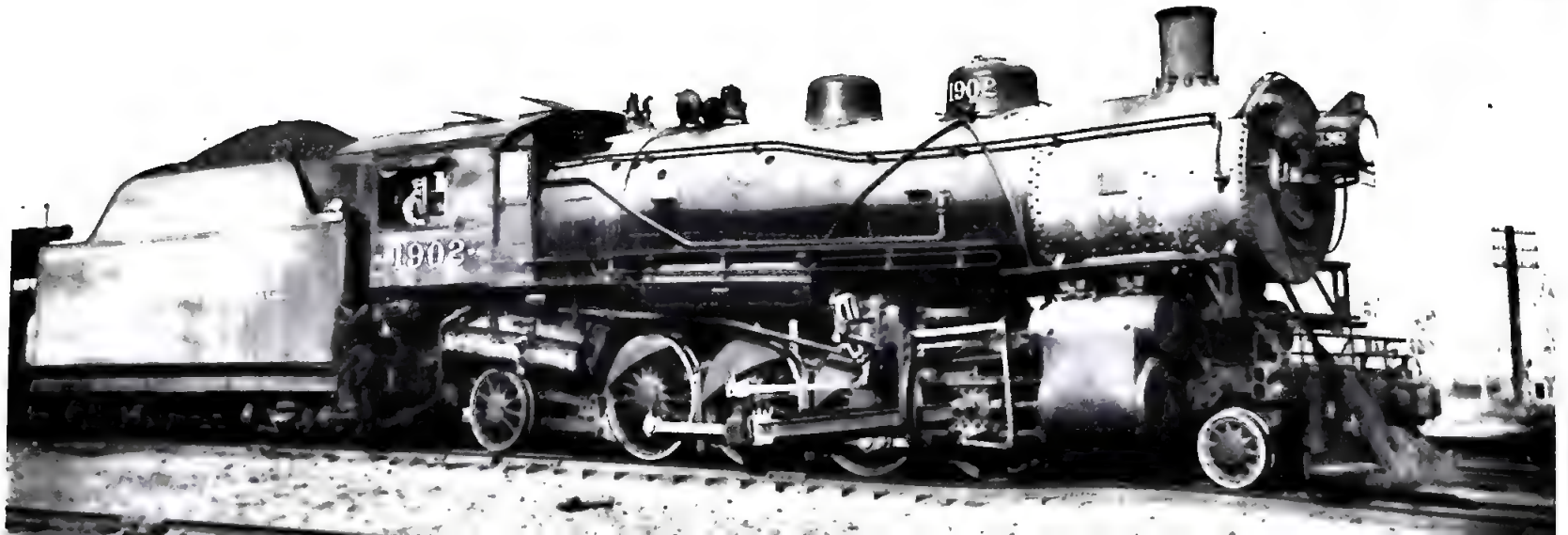
A unique Mikado subgroup was class W-4, Engines 2500-2505. These were rebuilt during 1918-1919 from T-class prairie types delivered in 1906-1907. Like many of the W-class engines, the W-4 group saw much switching service. Like the W-class, they also retained their Stephenson valve motion.



Albert Farrow

W-1 Engine 1699 (above) at Auburn, Wash. on June 25, 1936 closely resembles W-2 Engine 1902 (below) at Glendive, Mont. on April 28, 1937. Previously numbered 1552, then 1602, the 1902 was rebuilt from a tandem compound that was otherwise close kin to class W.

Albert Farrow

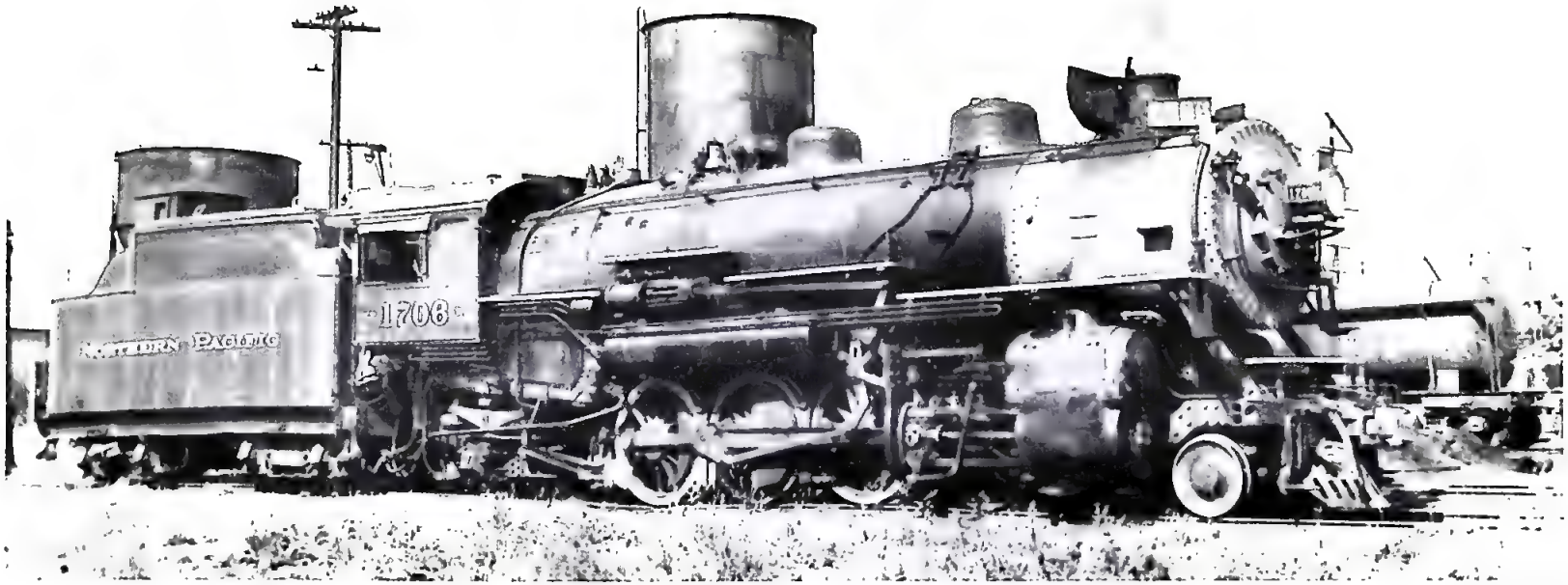


Albert Farrow

Ex-Compound 1905, coaling up at Auburn on July 17, 1953, wears a cast steel pilot.

Albert Farrow

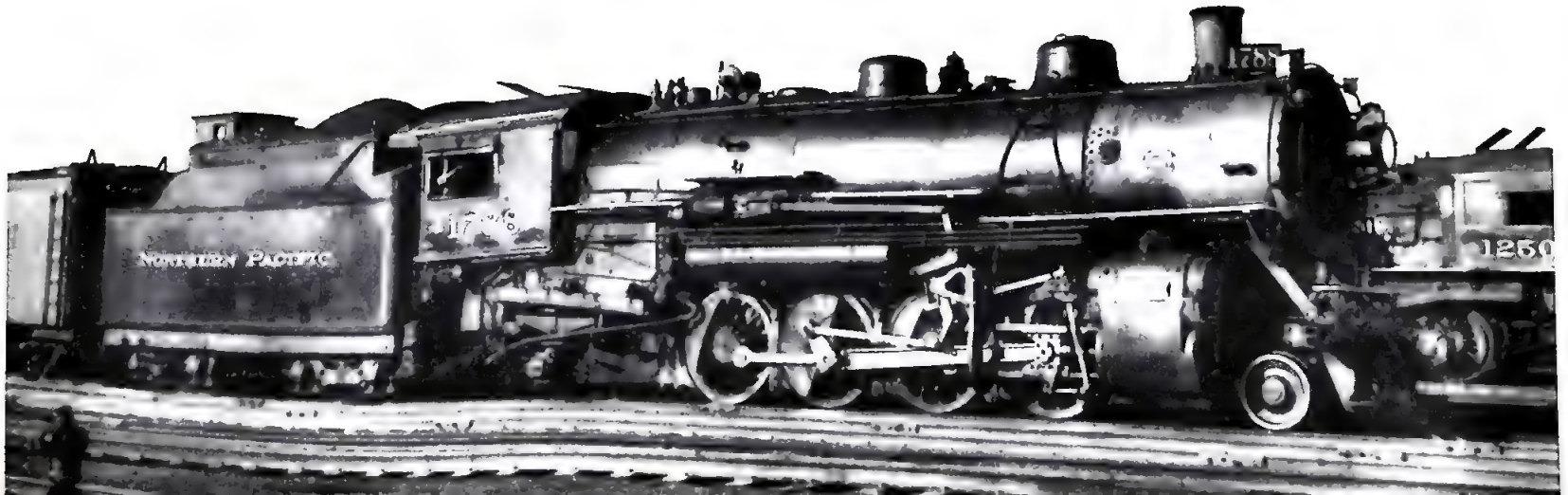
Mikado 1913 crosses the long bridge between Buckley and Enumclaw, Wash. on July 27, 1945.

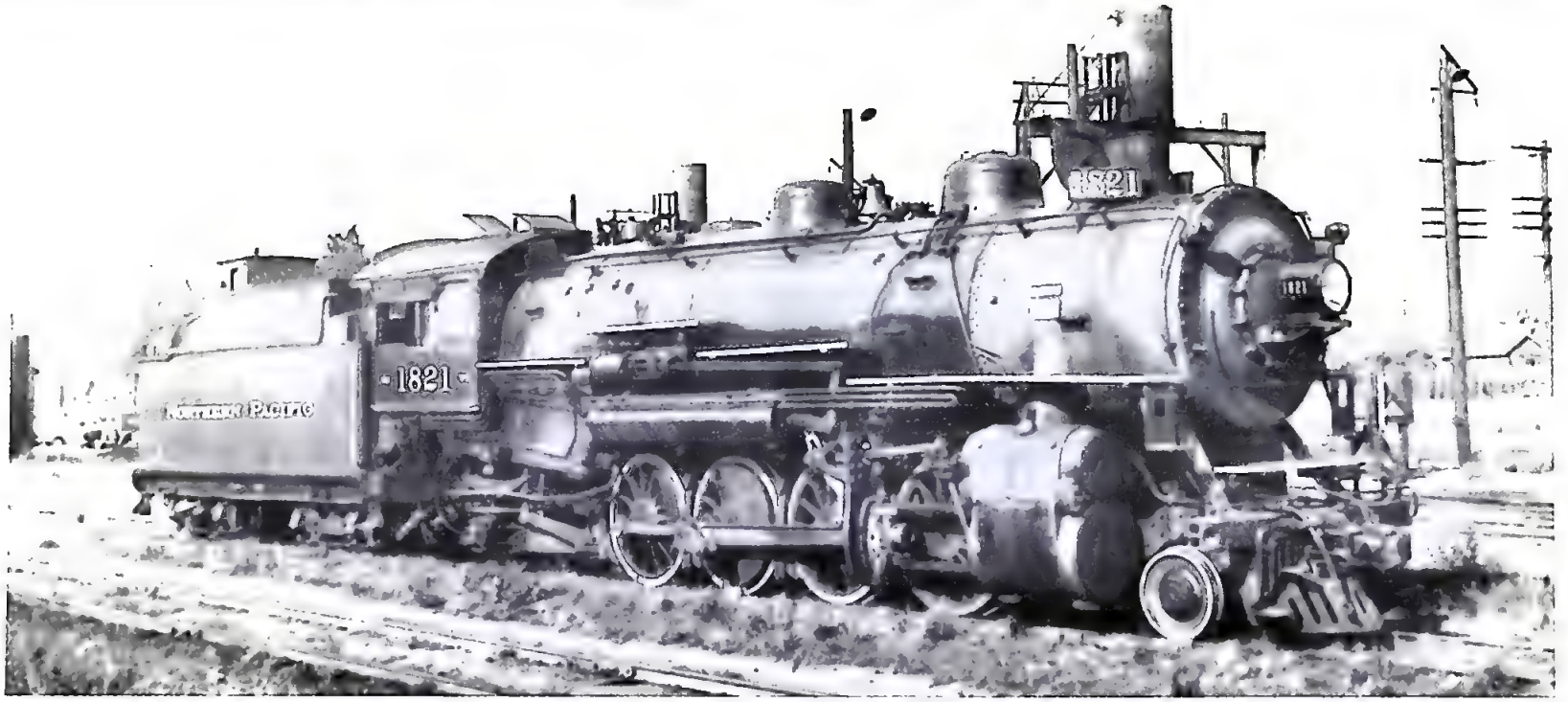


Albert Farrow

W-3 Mikado 1706 (above) is equipped to burn oil and wears a stack-mounted exhaust diverter at Auburn, Wash., June 27, 1956. Coal burning W-3 1788 (below) waits to take a freight out of Pasco, Wash., August 5, 1953.

Albert Farrow

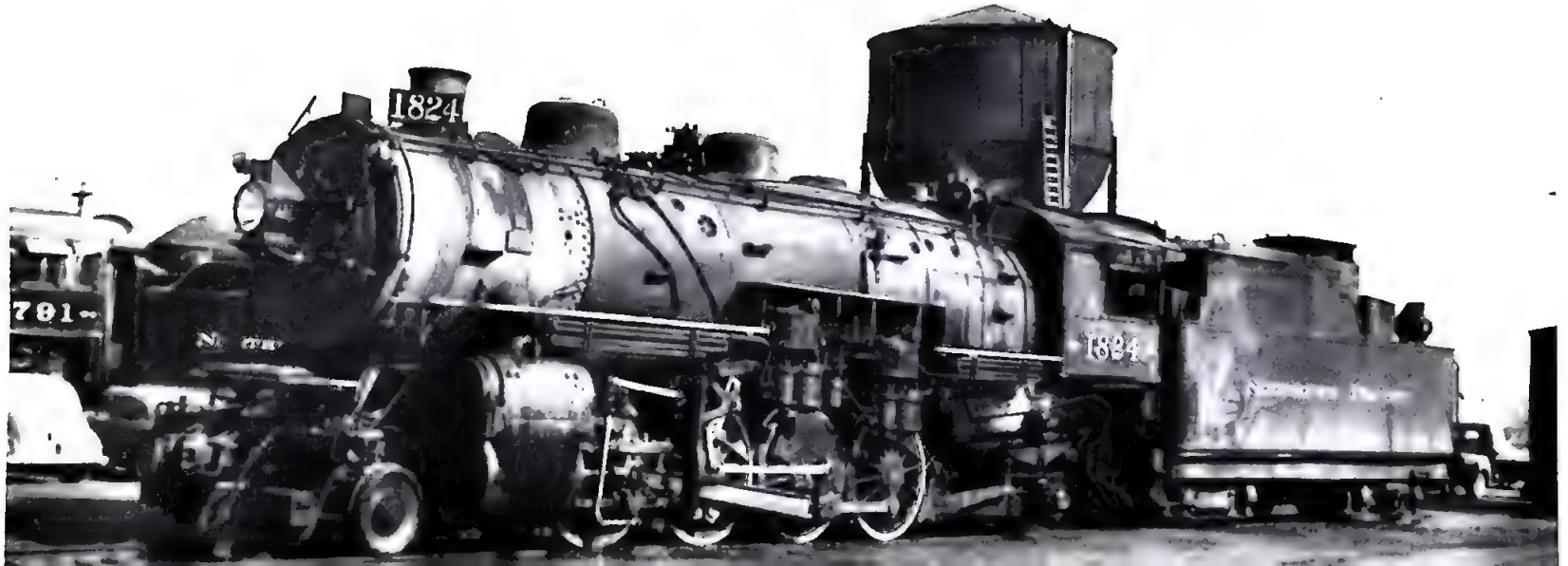




Albert Farrow

Oil burning Mikados 1821 (above, August 19, 1953) and 1824 (below, April 25, 1956) are both at Auburn.

Albert Farrow



Albert Farrow

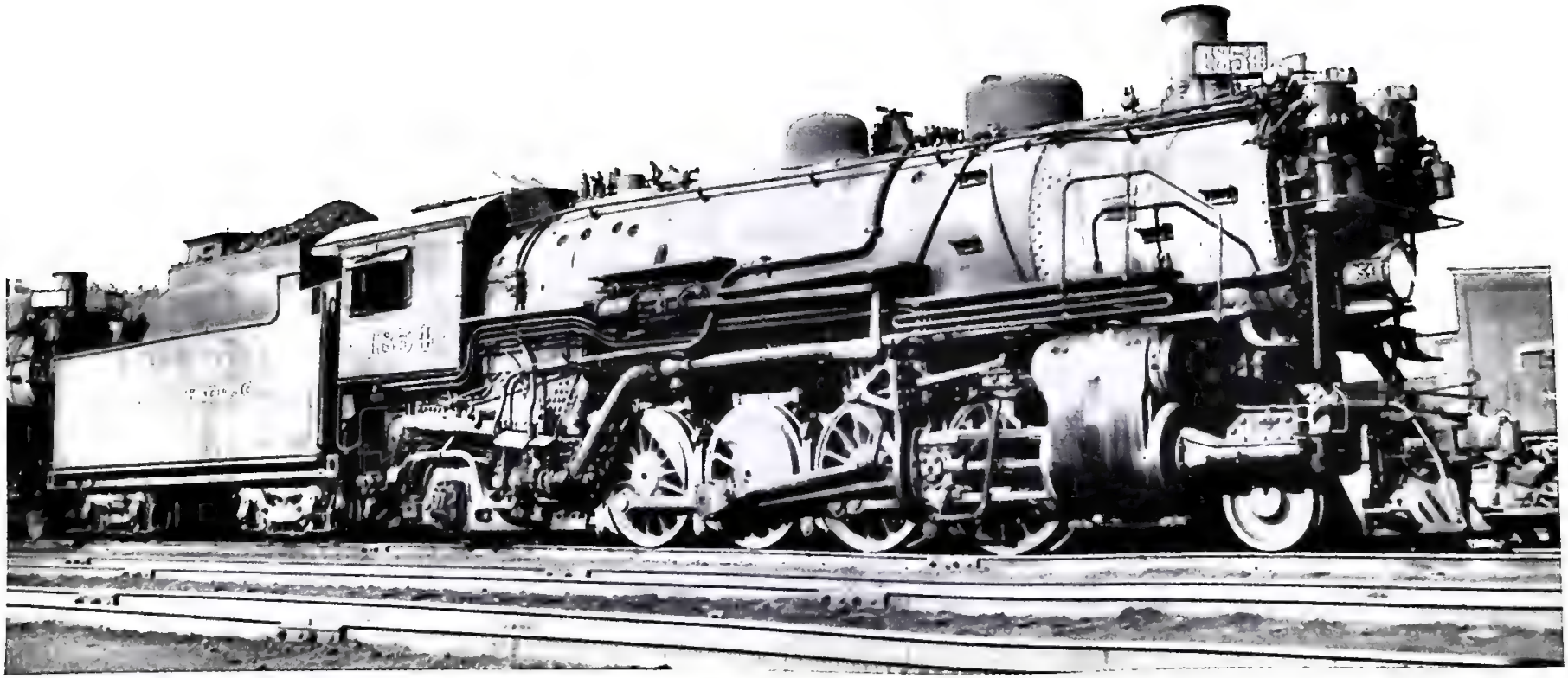
Engine 1748 crosses the Columbia River at Pasco, Wash., July 29, 1941.

Albert Farrow

W-3 Mikados 1803 and 1823 get heavy tonnage underway eastbound out of Auburn Yard on July 3, 1948.

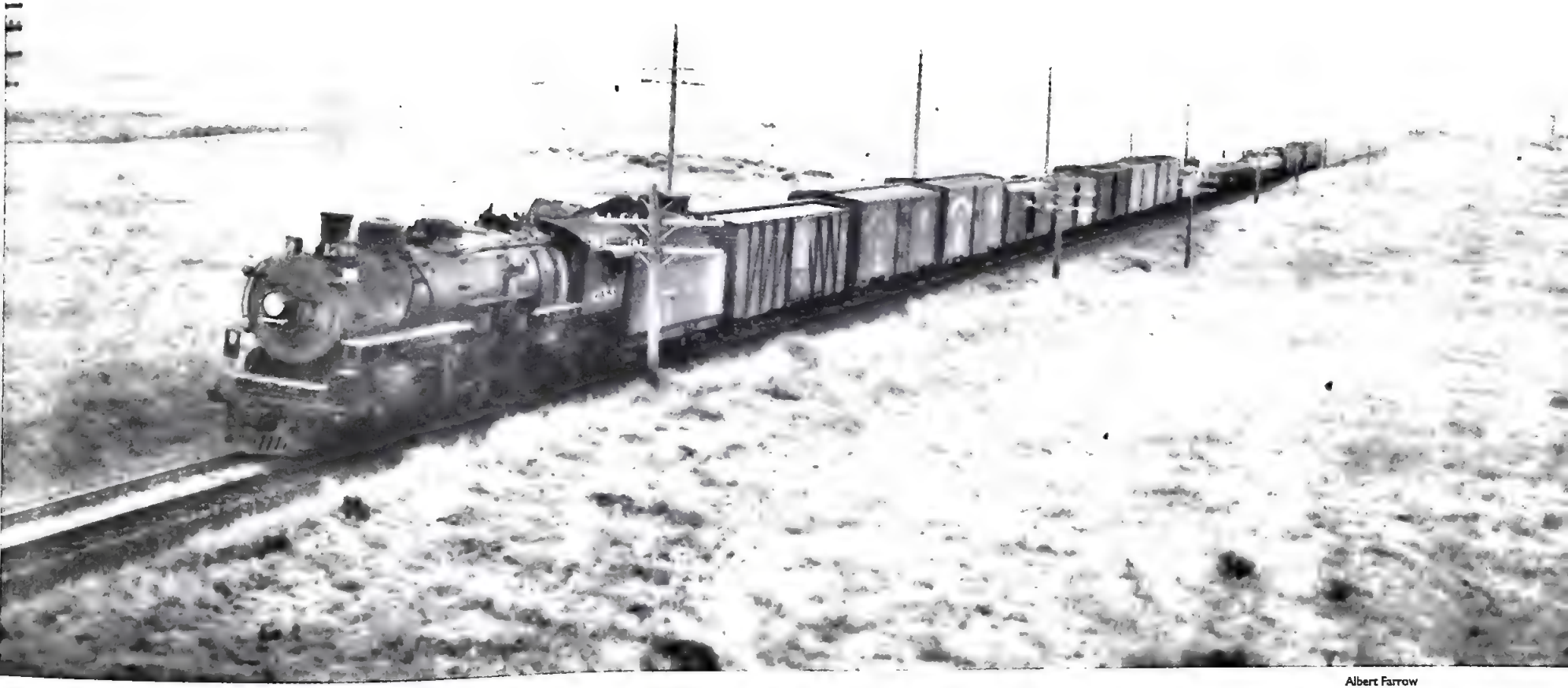
Albert Farrow

The 1803 awaits its next job in helper service at Woodinville, Wash., May 23, 1948.



Ray W. Buhrmaster

The W-5 Mikados, though deriving from the W-3 design, differed in several respects. Engine 1854, at Duluth, Minn. on September 23, 1955, has a booster-equipped Delta trailing truck, front-mounted air pumps, and an exhaust-steam injector.



Albert Farrow

W-3 1788 departs Pasco with an eastbound freight, July 28, 1950.

S. H. Mailer/Ray W. Buhrmaster collection

Duluth, Winnipeg & Pacific Train 20 nears West Duluth Yard behind CNR Pacific 5133 in October, 1956.

Robert M. Hanft/Ray W. Buhrmaster collection

Duluth Union Depot & Transfer Co. Engine 4, a former Northern Pacific T-class 2-6-2, pauses with the Soo Line Union Station, shared by the Soo and the DSS&A, in the background.

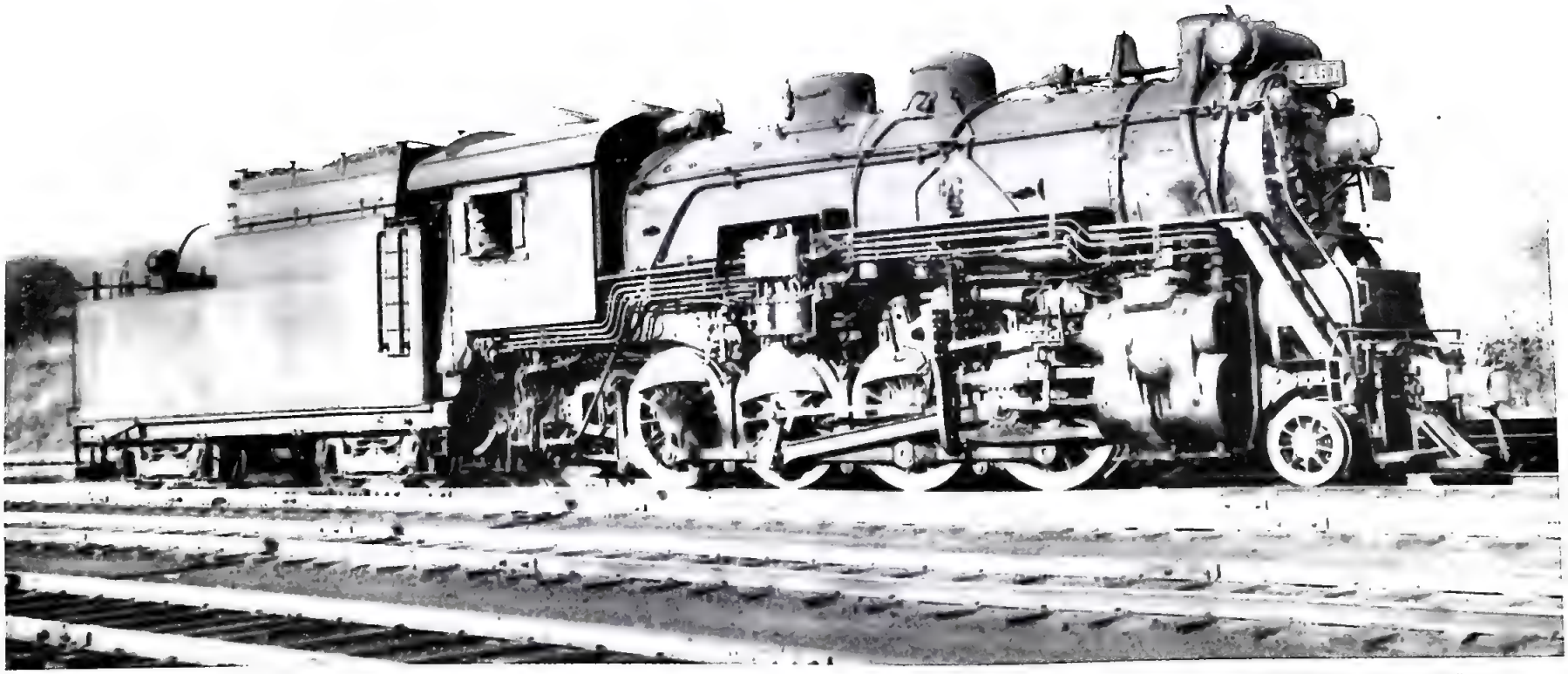
A DULUTH STEAM SAMPLER

A rich diversity of locomotives served Duluth, Minn. Some of the nation's largest power hauled ore for the less-than-giant Duluth, Missabe & Iron Range Railroad. Duluth also provided haven for smaller locomotives on some of the larger systems.

Engines of the NP, GN, and the C&NW network were among those represented here. The Duluth, Winnipeg & Pacific, a Canadian National subsidiary, employed both parent road power and its own. Notable, too, were smaller operations such as the Duluth, South Shore & Atlantic, Duluth & Northeastern, the Lake Superior Terminal & Transfer Company, and the Duluth Union Terminal & Transfer Company.

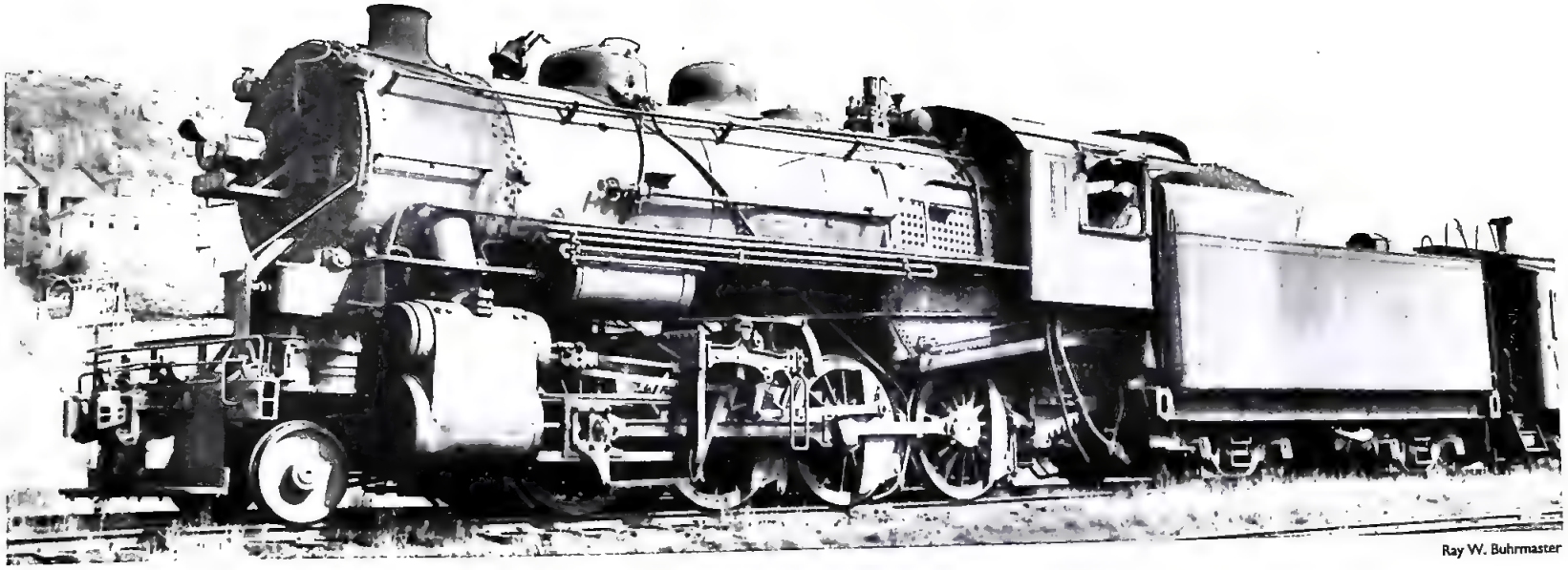
As in other cities with complex rail networks, local operations encompassed much territory beyond the political borders. The adjacent city of Superior, Wis. was an important site of rail activity, and the DM&IR, in particular, operated major facilities at Proctor, Minn. atop a steep grade out of Duluth proper.

A huge iron ore-handling port, Duluth and neighboring Superior, Wis. were major handlers of this vital tonnage. The comings and goings of the Great Lakes ore-carriers materially affected traffic flows, leading to heavy stockpiling when winter ice brought waterborne commerce to a temporary standstill.



S. H. Mailer/Ray W. Buhrmaster collection

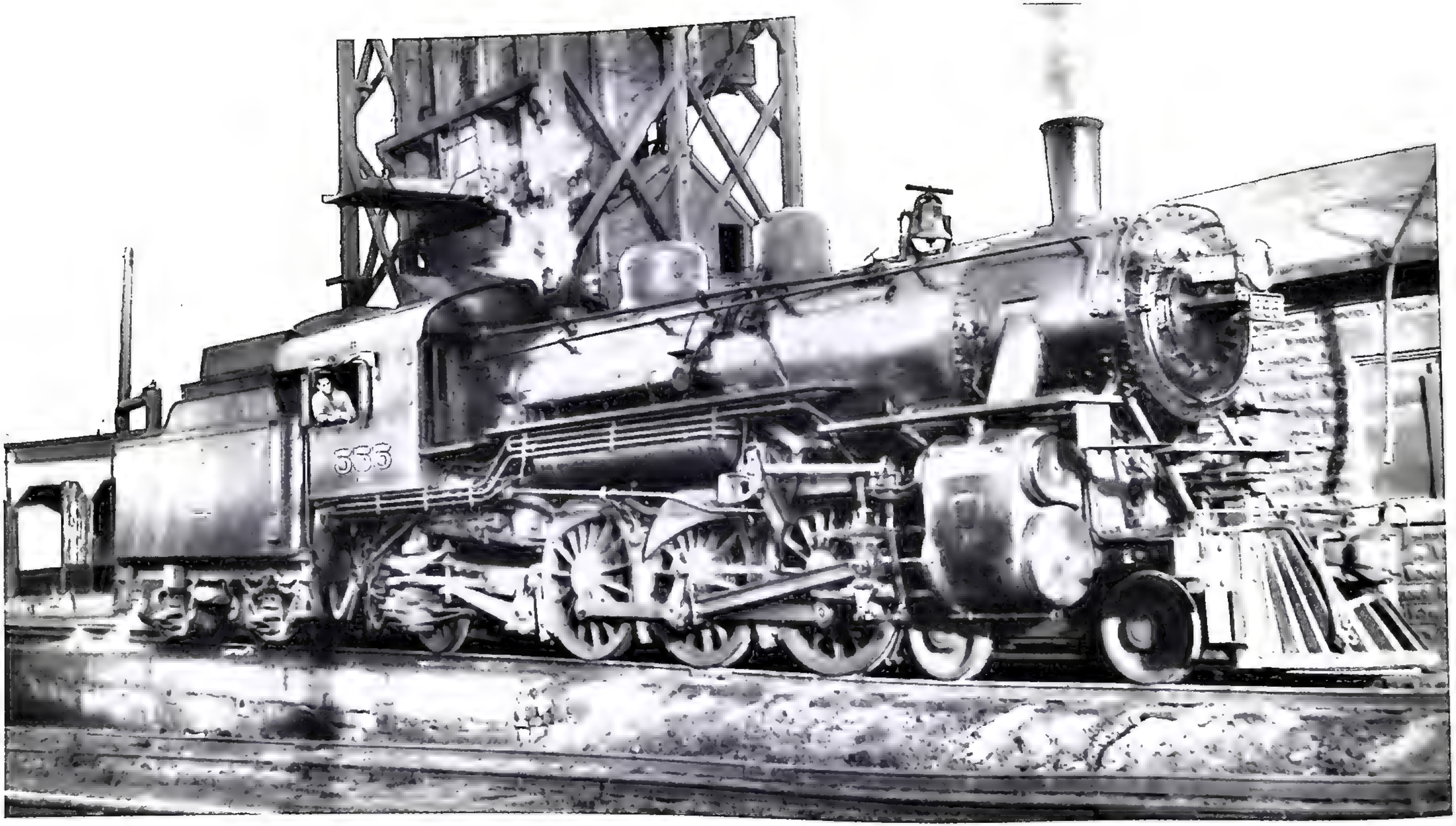
Duluth, Winnipeg & Pacific Consolidation 2461 is at West Duluth on October 21, 1955. The prominent grab rails on the tender reflect regulatory requirements for Canadian service.



Ray W. Buhrmaster

CStPM&O 218, sister to the famed C&NW Zulus, appears above on June 28, 1953, while Engine 81 (below), one of the road's 0-6-0 switchers, is there on August 11, 1953.

S. H. Maller/Ray W. Buhrmaster collection



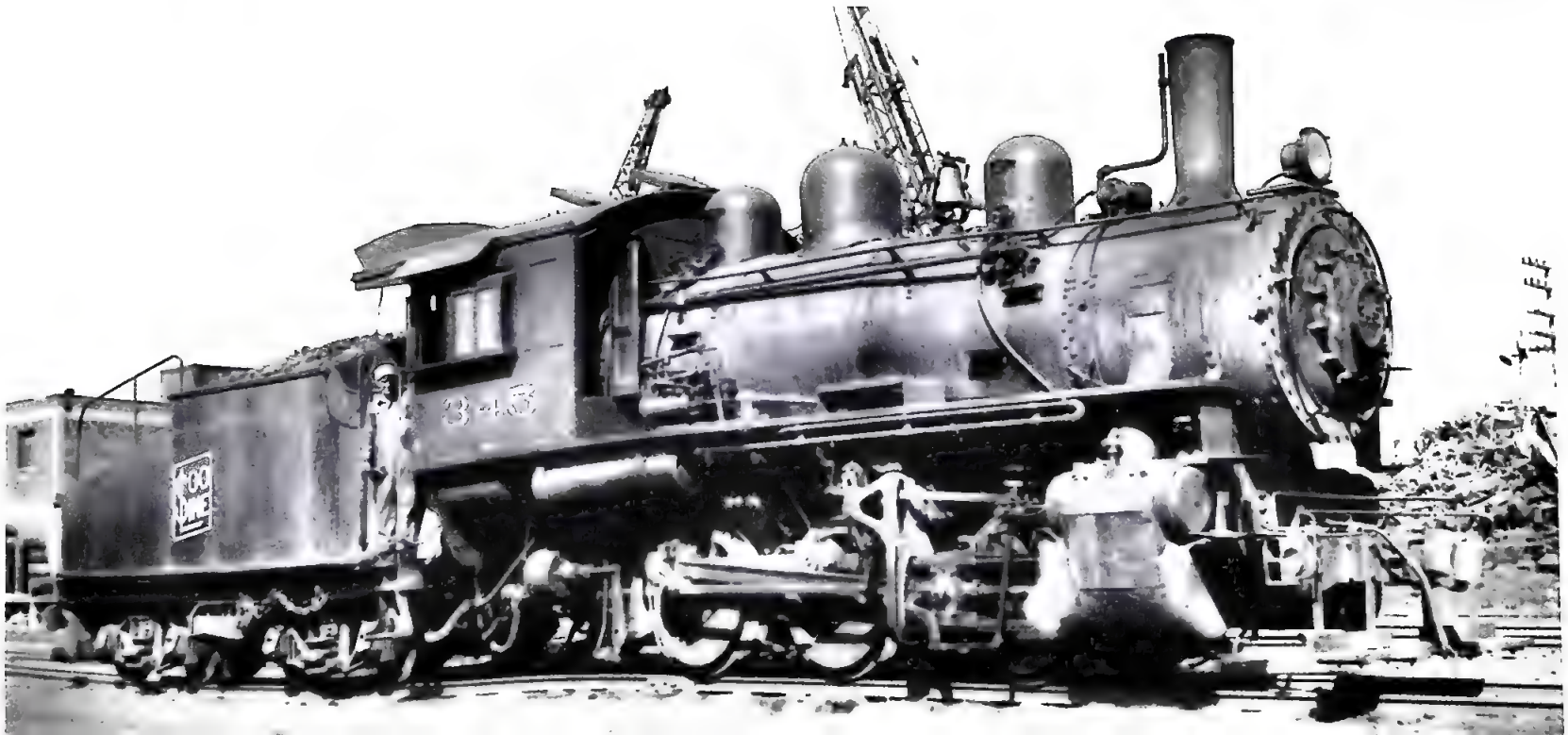
M. L. Kunde/Ray W. Buhrmaster collection

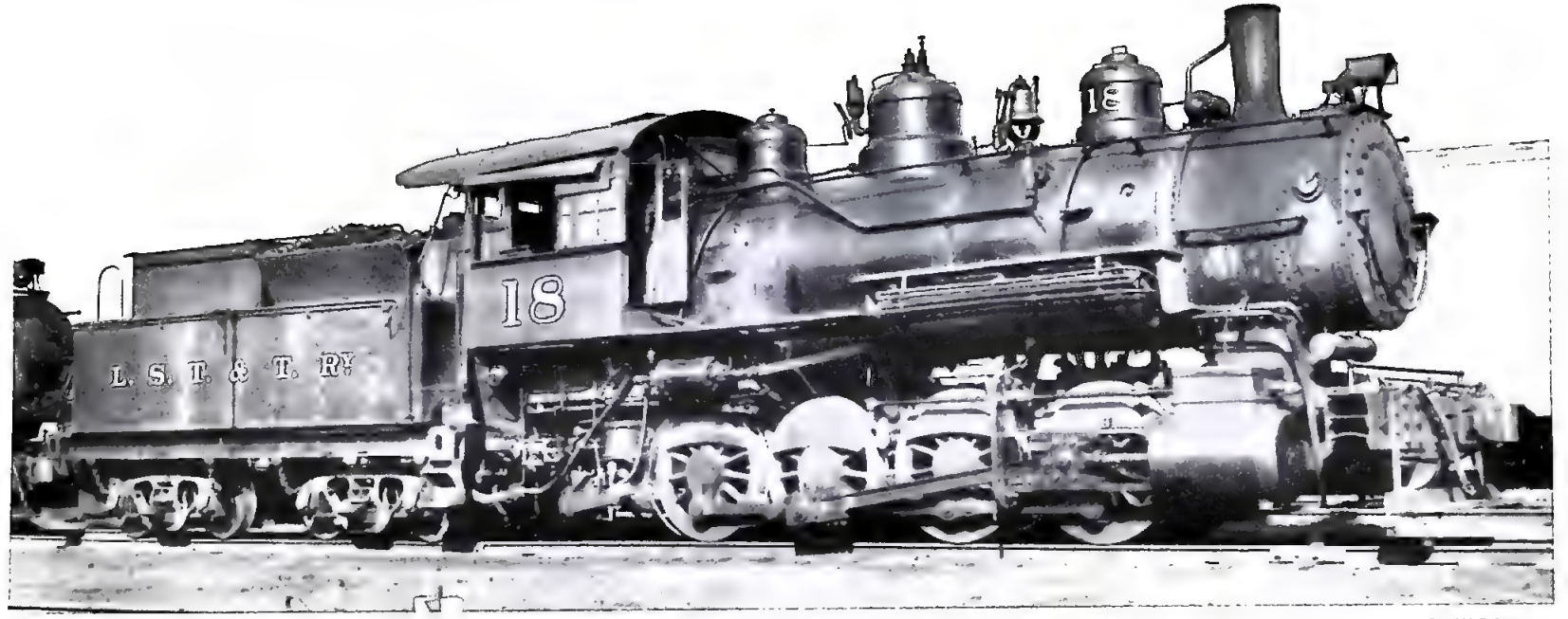
Duluth, South Shore & Atlantic 555, a trim light Pacific, is at the Soo Line's West Duluth Engine Terminal, July 20, 1948.

Ray W. Buhrmaster

June 28, 1953 finds Soo Line Pacific 2719 (above) and Switcher 345 (below) at West Duluth Engine Terminal.

Ray W. Buhrmaster

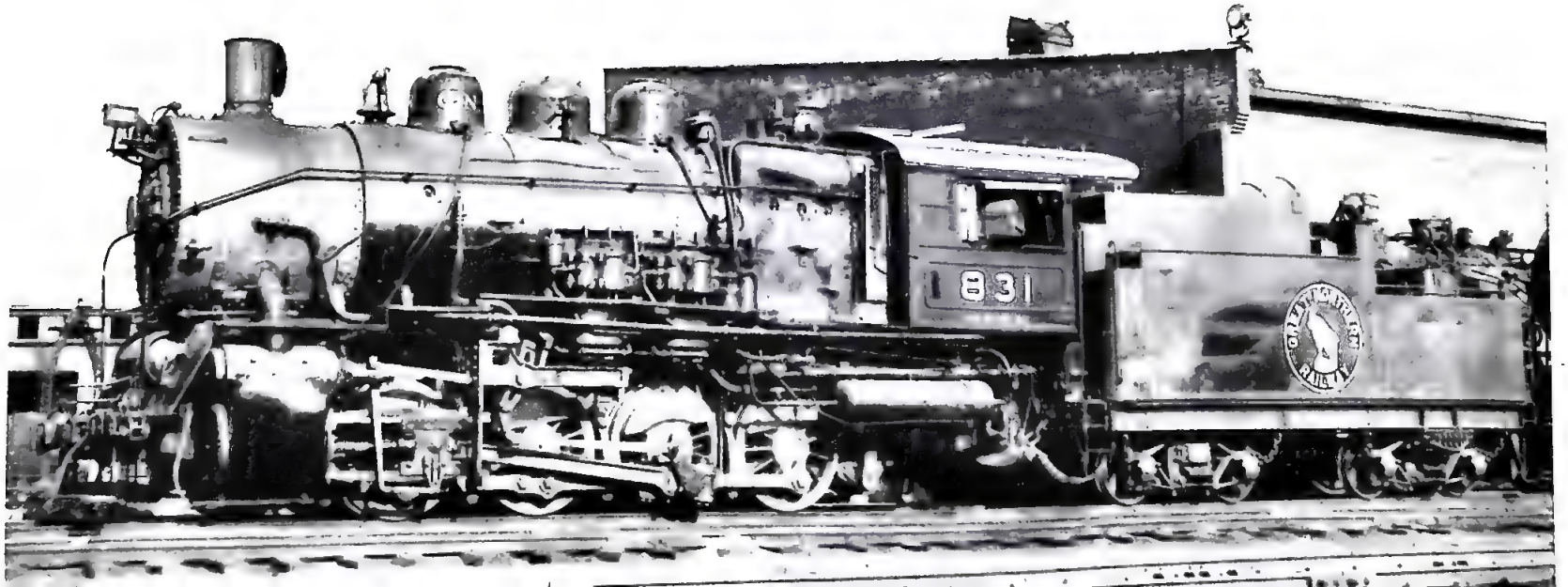


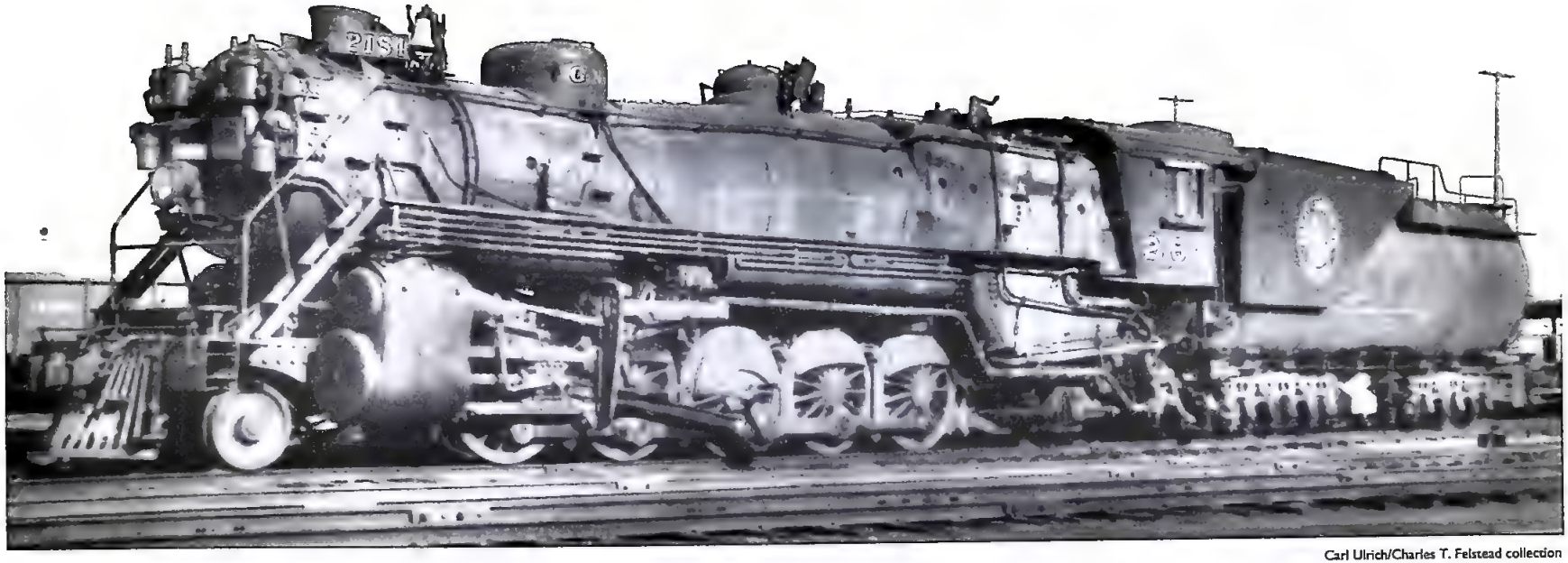


Ray W. Buhrmaster

Lake Superior Terminal & Transfer 0-8-0 18 (above) is at Superior, Wis. on June 16, 1955, as is a far heavier 0-8-0, Great Northern 831 (below).

Ray W. Buhrmaster

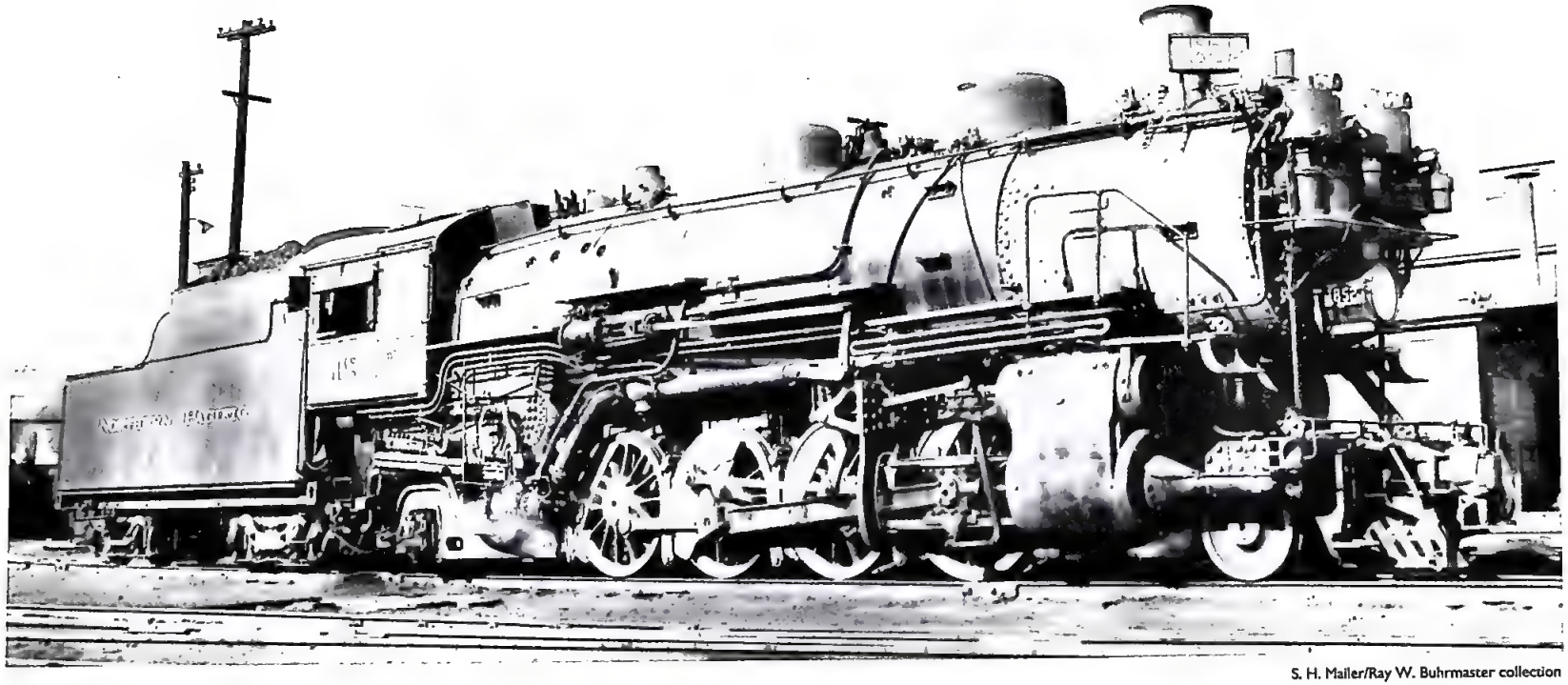




Carl Ulrich/Charles T. Felstead collection

Santa Fe type 2184 of the Great Northern (above, Superior, July, 1954), presents a sharp contrast to Light Consolidation 14 of the Duluth & Northeastern (below) at nearby Cloquet, Minn., September 21, 1963.

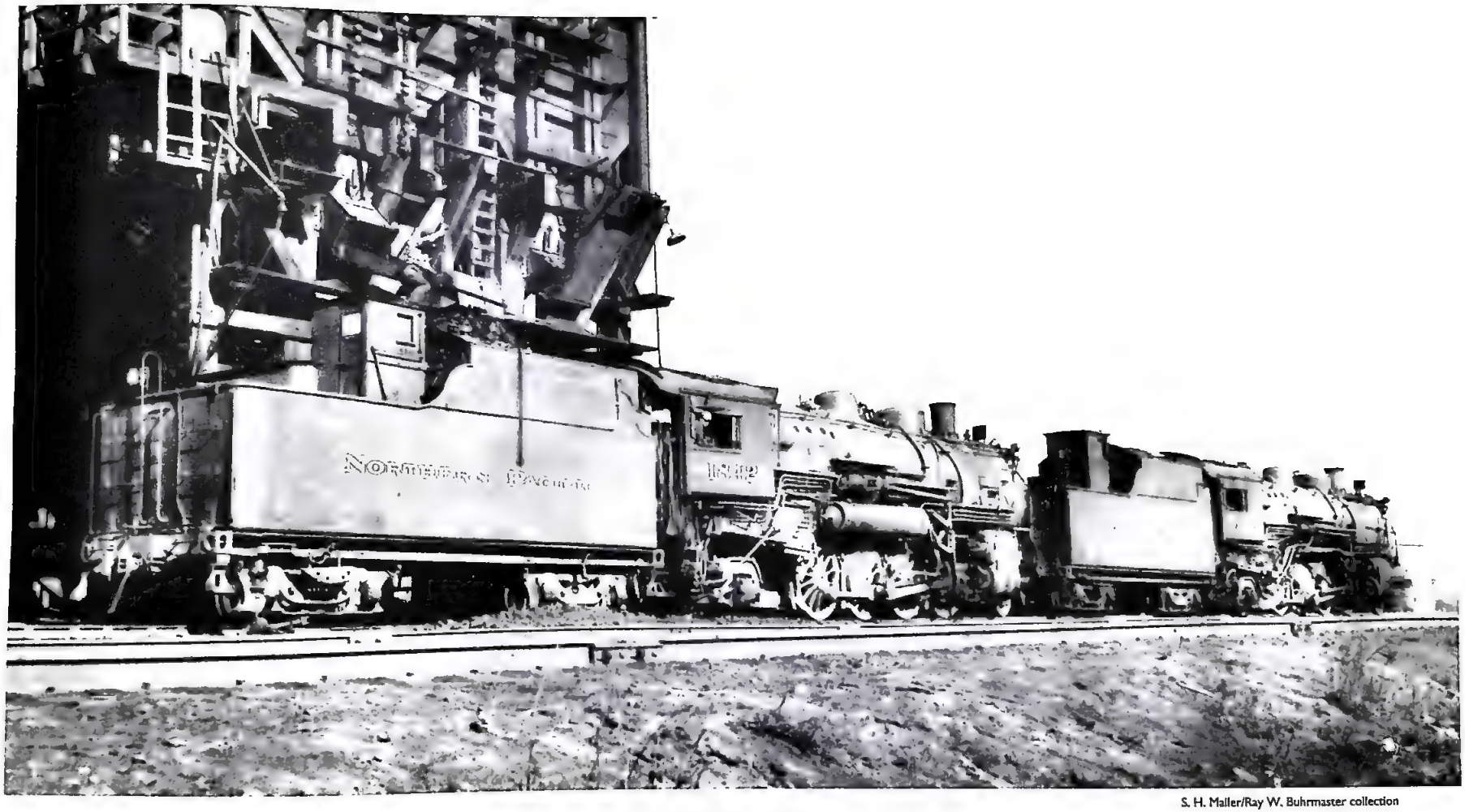
Ray W. Buhrmaster



S. H. Mailer/Ray W. Buhrmaster collection

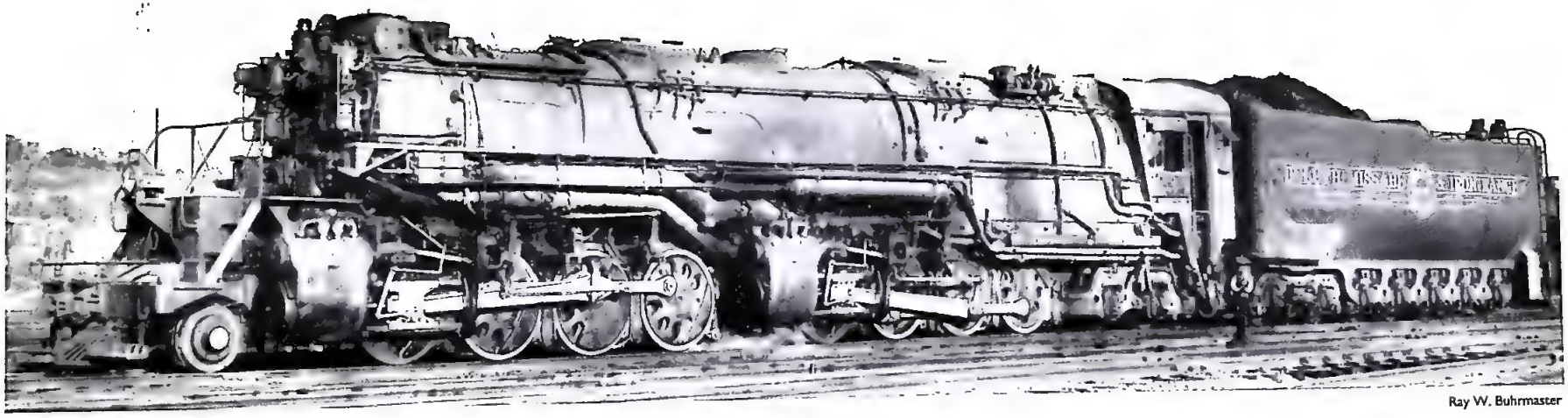
Northern Pacific Mikado 1852 (above) is at Duluth in August, 1953. Switcher 1178 (below) is there in yard service on October 7, 1956.

S. H. Mailer/Ray W. Buhrmaster collection



S. H. Maller/Ray W. Buhrmaster collection

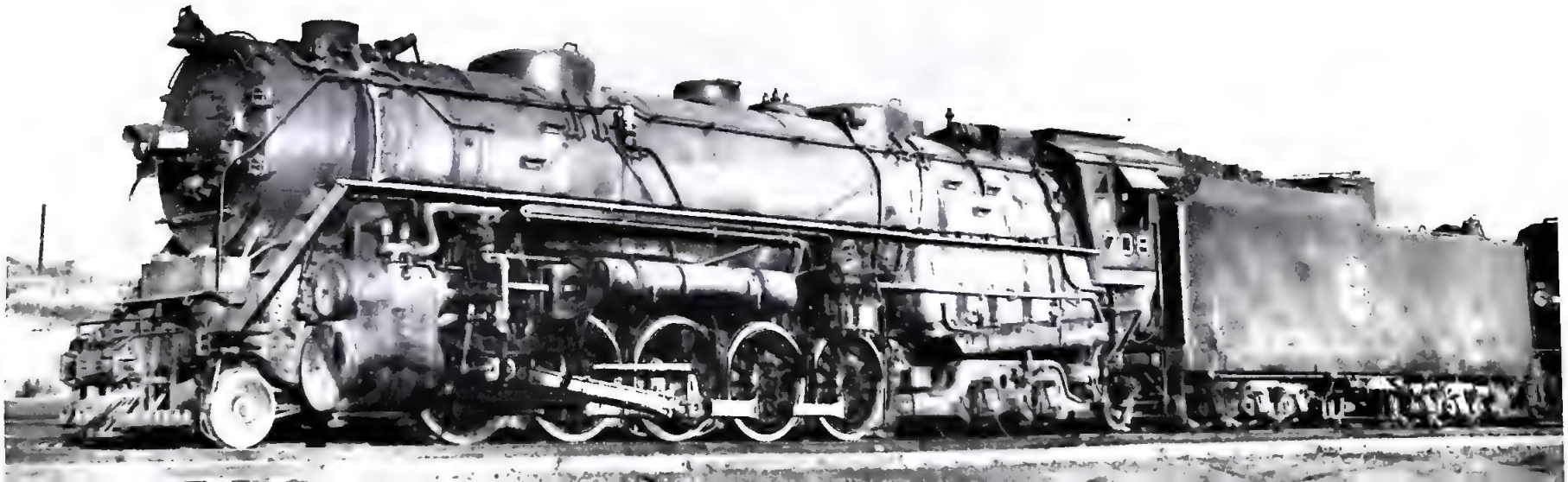
Northern Pacific W-5 Mikados 1852 and 1842 await departure at the Rice's Point coal dock in Duluth.

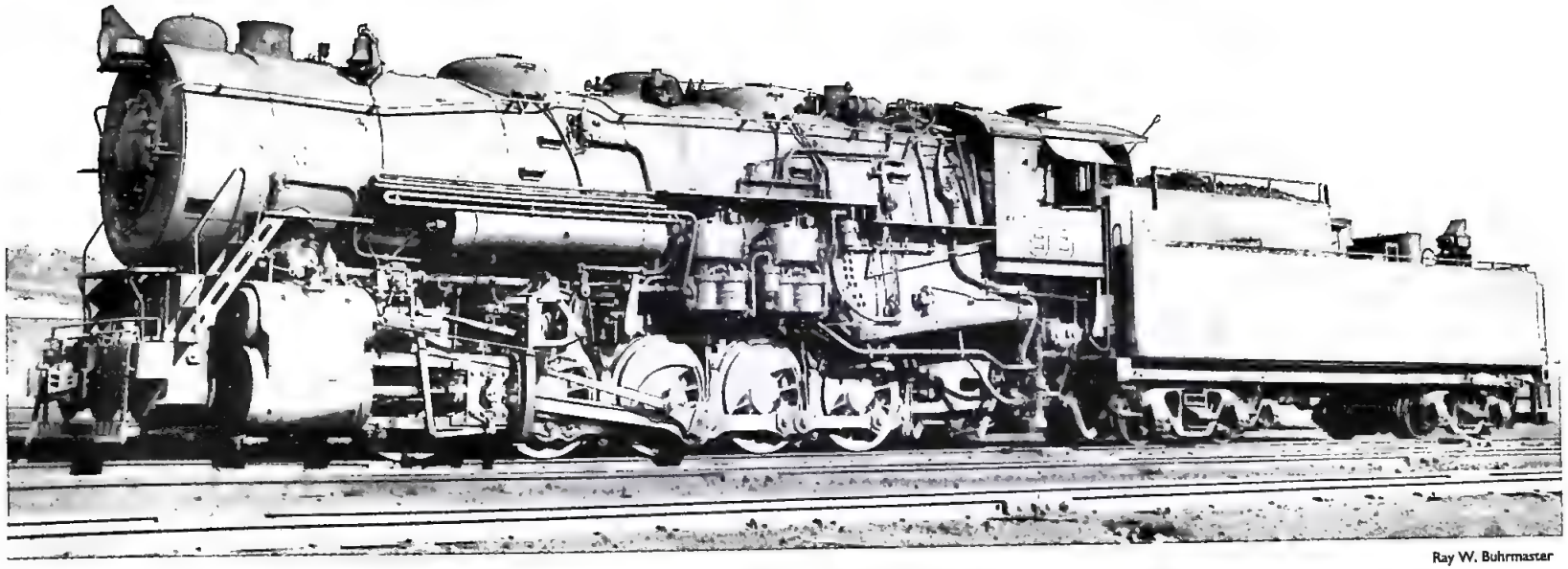


Ray W. Buhrmaster

Biggest power at Duluth included such engines as DM&IR 2-8-8-4 234 (above, September 30, 1957) and 2-10-4 708 (below, September 23, 1956), the latter formerly Bessemer & Lake Erie 5629. Both are at Proctor, Minn., up the hill from Duluth.

RayW. Buhrmaster

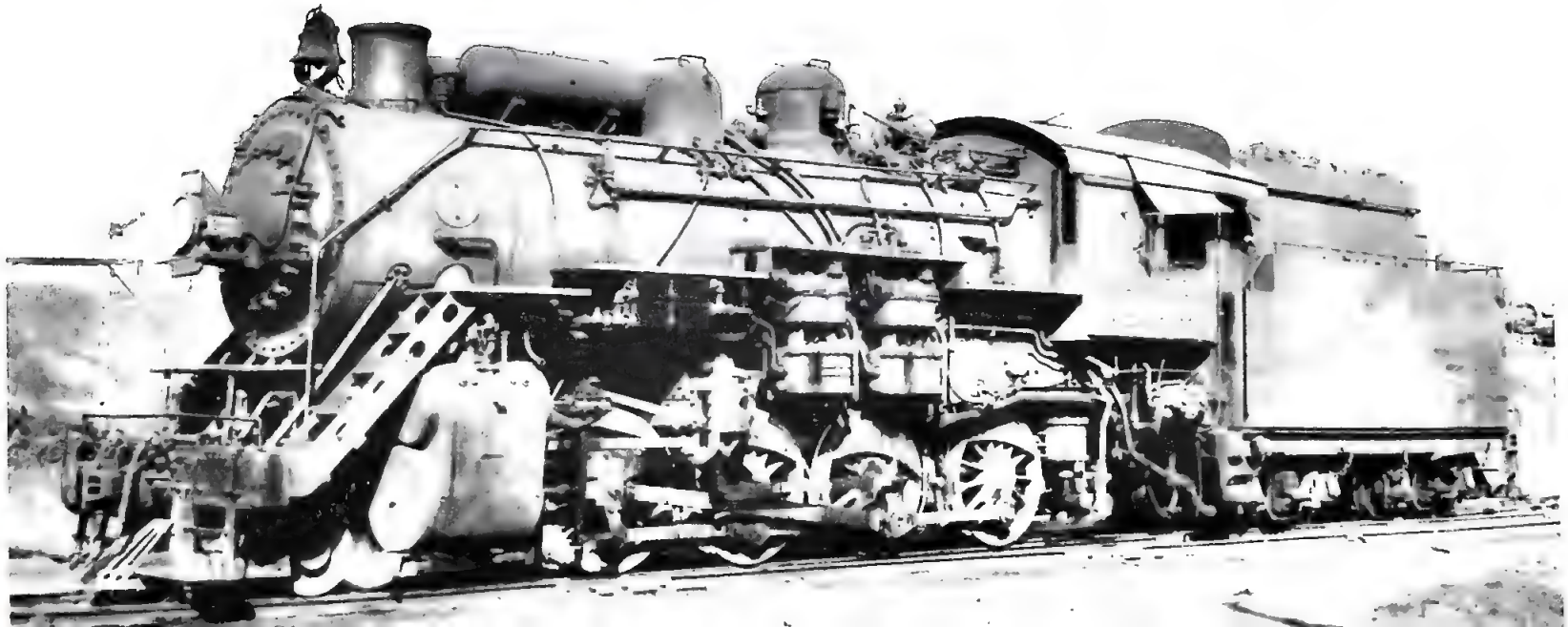




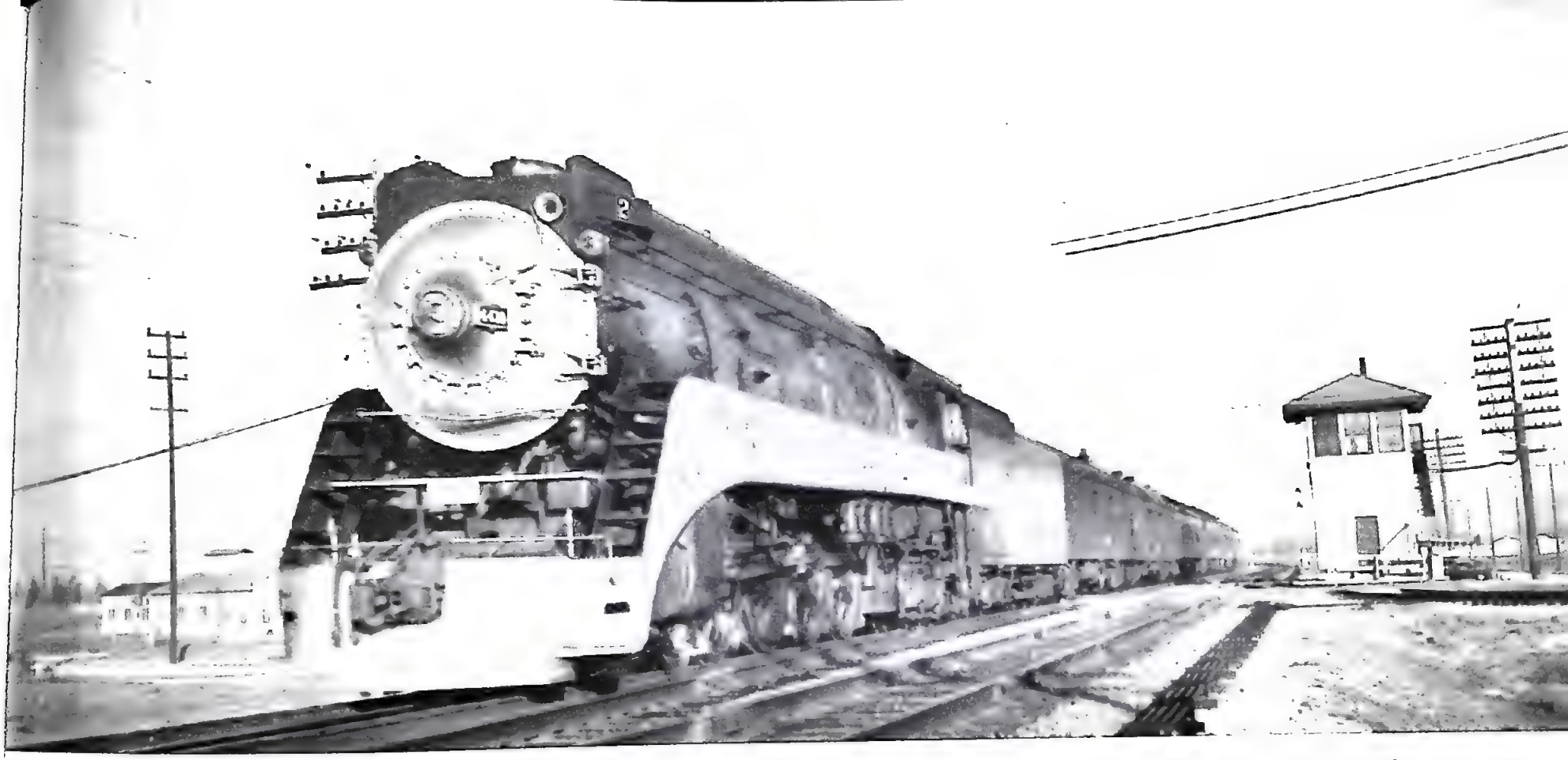
Ray W. Buhrmaster

DM&IR 93 (above), a huge 0-10-0 Switcher, is at Proctor on September 24, 1956. Consolidation 1223 is working at Duluth on October 21, 1955.

S. H. Mailer/Ray W. Buhrmaster collection



In September, 1938, Southern Engineer Walter Thrall photographed Southern Railway Ts-1 class Mountain type 1459 at Knoxville, Tenn. waiting for Train 42, the Memphis Special.



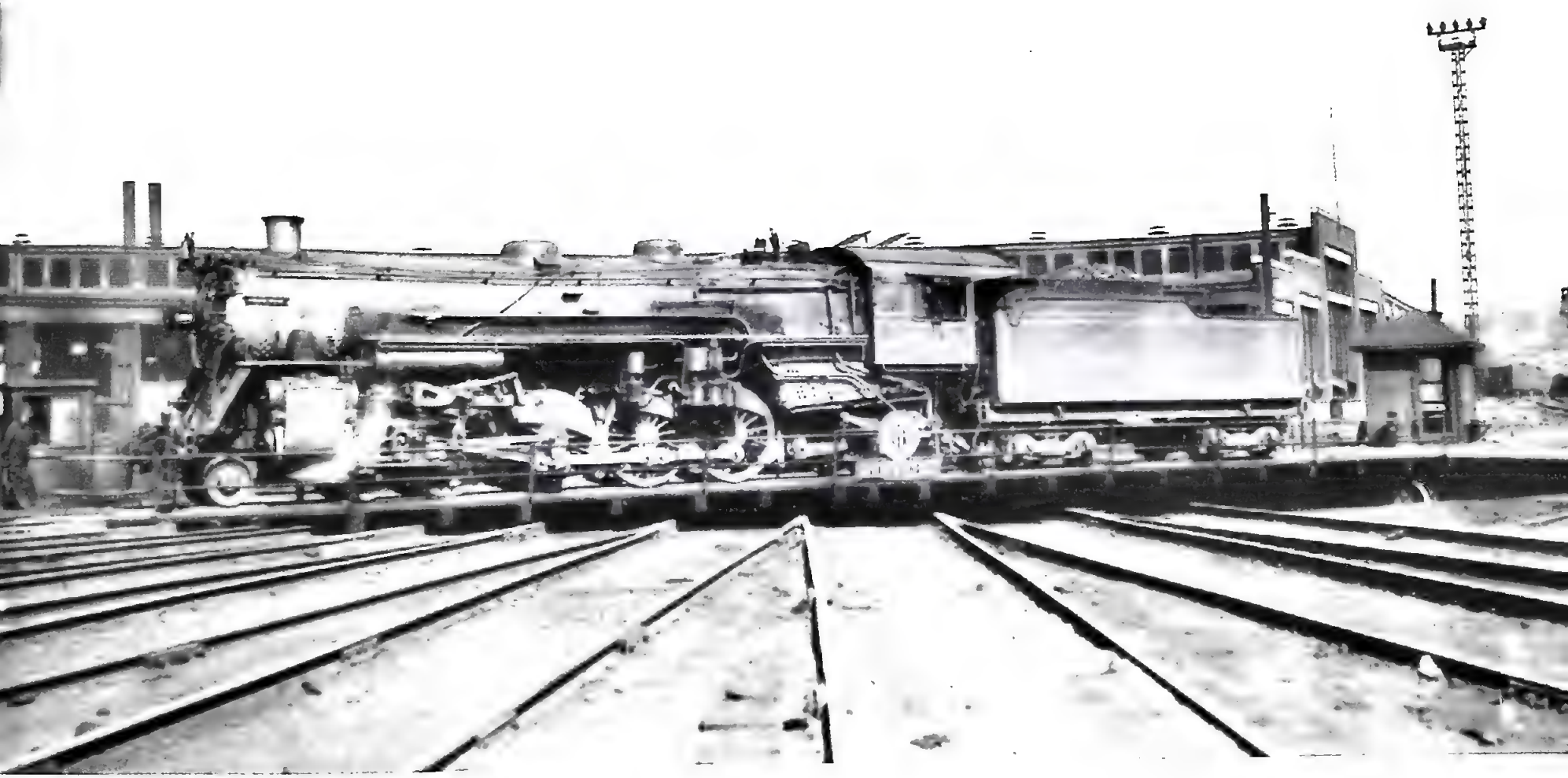
March, 1940 found the Thrall camera capturing Southern Pacific 4-8-4 4410 charging eastward at Burbank Junction, Cal. with Train 2, The Sunset Limited.

PHOTOS BY WALTER H. THRALL, JR.

The late Walter H. Thrall, Jr. enjoyed a unique career in the railroad world. First a fireman, later an engineer, on the Southern Railway, he subsequently moved to the Los Angeles, Cal. area. There he resumed a long career at the throttle on the Union Pacific.

Through the years, he became an adept photographer, working with equal interest in classic locomotive photography and at the art of capturing trains at rest or in action. Though perhaps best known for work in his two home regions, he traveled widely across North America with camera in hand. The sampling of his work on these pages has been provided by Frank E. Ardrey, whose own work frequently appears in Locomotive Quarterly.

Southern Railway Ten Wheeler 1077, Selma, Ala., September, 1938.



Southern Railway 4-8-2 1454 rides the turntable at Asheville, N. Car. in September, 1937.

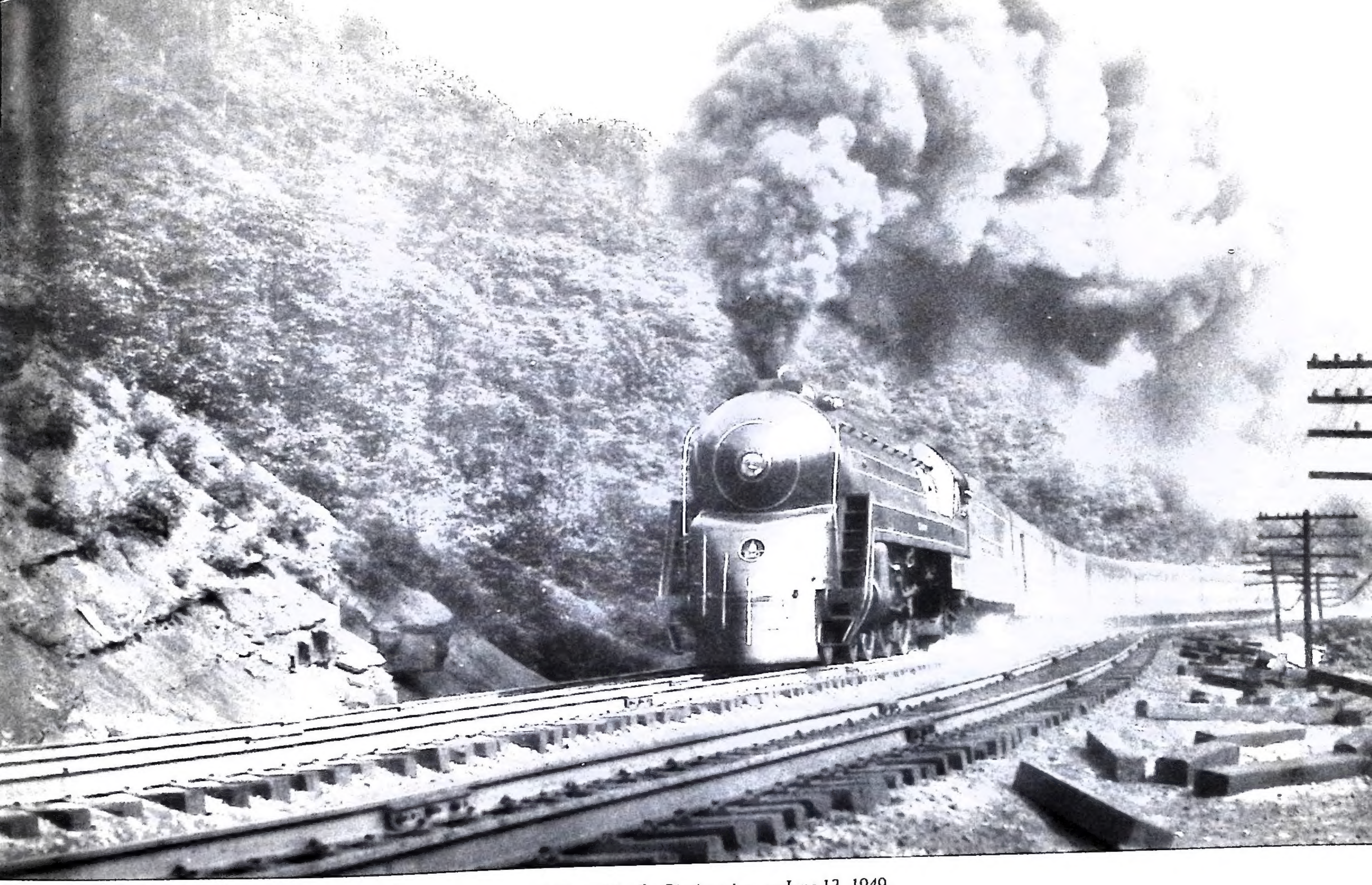
Sierra Railroad Extra 24 East arrives at Sonora, Cal. behind Consolidation 24 on September 16, 1950.

Southern Pacific 4-8-8-2 4114 (above) rolls Train 60, The West Coast Limited, at 50 miles per hour at Burbank, California in February, 1940. Santa Fe streamstyled Pacific 1369 (below) heads The Valley Flyer at Los Angeles ca. 1940.

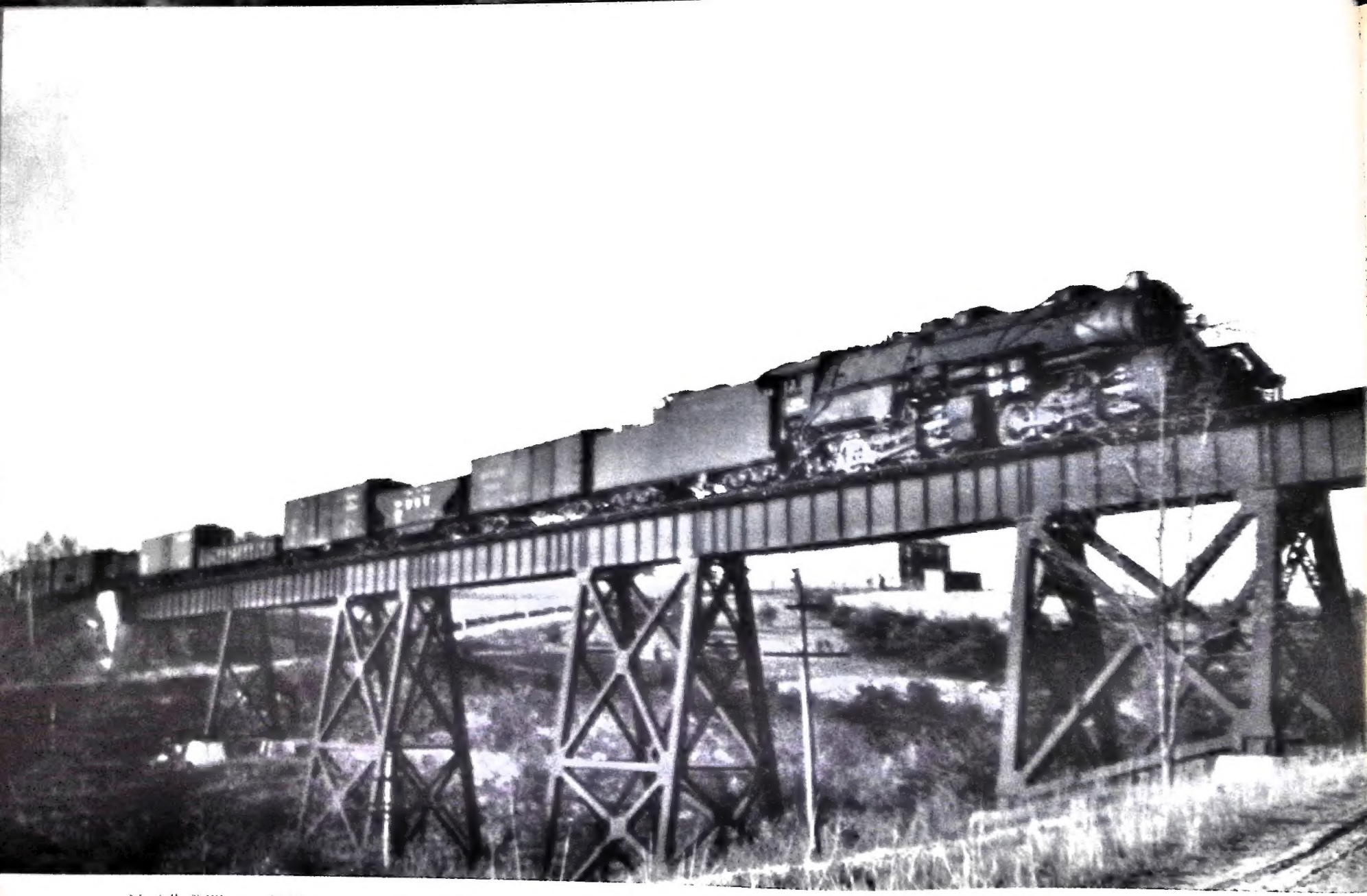
A rainy Rocky Mountain day, September 26, 1949, did not deter Walter Thrall from capturing Canadian Pacific Train 8, The Dominion, emerging from the first spiral tunnel at Yoho, British Columbia behind 2-10-2 5813, 2-8-2 5404, and 2-10-4 5927.

The same rain storm on the same day as the preceding page finds the same triple header taking Train 8 across the Kicking Horse River on June 26, 1949.

Baltimore & Ohio 2-8-8-4 7614 brings Train 96 across the Allegheny summit at Altamont, W. Va., June 13, 1949.



B&O 5301 charges upgrade at Amblersburg, W. Va. with Train 76, The Cincinnatian, on June 12, 1949.



Norfolk & Western 2120 crosses a trestle near Shenandoah, Va. on the road's famed Shenandoah Valley line.

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- Frisco Lines Power, Part 1
- N.Y.O. & W. 2-10-2s
- Seattle Steam
- Newell Martin's Photography

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